

UGANDA PROTECTORATE.

ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR THE

YEAR ENDED 31ST MARCH, 1919.

Published by Command of His Excellency the Governor.



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1920.

UGANDA PROTECTORATE.

DEPARTMENT OF AGRICULTURE.

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VETERINARY OFFICE AND LABORATORY	...	...	...	Kampala	63	14
ENTOMOLOGICAL OFFICE AND LABORATORY	...	...	...	Kampala	5	25
BOTANICAL OFFICE AND LABORATORY	...	...	...	Kampala	5	26
BOTANIC GARDENS AND METEOROLOGICAL OFFICE	...	...	...	Entebbe	60	38

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- | | |
|------------------------|------------------------|
| (1) Kampala. | (3) Simsa, Soroti. |
| (2) Kakumiro, Mubendi. | (4) Fort Portal, Toro. |
| (5) Kumi, Teso. | |

ANNUAL REPORT, 1918-19.

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STAFF LIST.

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Clerk A. S. WIDGERY.

GENERAL DIVISION:

District Agricultural Officers :

L. HEWETT, M.R.A.C.	A. R. MORGAN.
R. G. HARPER.	T. D. MAITLAND.
J. D. SNOWDEN.	

Assistant District Agricultural Officer ... D. HALKERSTON.

BOTANICAL DIVISION:

Curator, Botanic Gardens, Entebbe ... T. D. MAITLAND.

BIOLOGICAL DIVISION :

<i>Entomologist</i>	...	...	...	C. C. GOWDEY, B.Sc., F.E.S., F.Z.S.
<i>Botanist</i>	...	...	...	WM. SMALL, M.B.E., M.A., B.Sc.

VETERINARY DIVISION :

Chief Veterinary Officer ... E. HUTCHINS, M.R.C.V.S.

Veterinary Officers :

U. F. RICHARDSON, B.Sc., M.R.C.V.S.	W. F. POULTON, M.R.C.V.S.
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Stock Inspectors :

H. A. STRAUSS.	F. A. POESTKOKE.	L. A. GOULD.
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Indian Veterinary Assistants :

FAKHAR-UD-DIN.	FAZAL-UD-DIN-AHMEDI.	SHEIK INAYAT ULLAH.
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CLERICAL STAFF :

Clerks :

J. A. M. D'SA.	J. X. DE MELLO.
W. NORONHA.	J. J. FIALHO.

ANNUAL REPORT
OF
THE DEPARTMENT OF AGRICULTURE,
UGANDA PROTECTORATE,
For the Year ended 31st March, 1919.

Staff.

Mr. S. Simpson, Director of Agriculture, went on leave on 10th December, from which date I took over the charge of the Department.

Mr. R. G. Harper, District Agricultural Officer, returned from leave on 6th February, 1919.

Mr. T. D. Maitland, District Agricultural Officer, acted as Curator, Botanic Gardens, Entebbe, throughout the year, in addition to his ordinary duties.

Mr. J. D. Snowden, District Agricultural Officer, was absent on short leave in British East Africa from 30th April to 8th July.

Mr. D. Halkerston, Assistant District Agricultural Officer, arrived on first appointment on the 28th May, 1918, and resigned on 31st January, 1919.

Mr. C. C. Gowdey, Government Entomologist, was on short leave in British East Africa from 18th June to 26th August.

Mr. W. Small, Government Botanist, reverted to civil duty on 4th February, having been on military duty since April, 1917. He was awarded the Order of the British Empire, 5th Class, in March.

Mr. L. A. Gould was appointed an additional Stock Inspector in October.

Veterinary Assistant F. D. Ahmedi returned from leave on the 29th April, 1918.

General.

The past year has again been one of difficulty for agriculture throughout the Protectorate. The news of the cessation of hostilities in November was accordingly received with all the greater relief in this country, as, apart from the significance of that event in itself, it brought promise of an early and definite end to the long period of trying conditions which have prevailed in Uganda, as elsewhere, and hindered agricultural progress.

The staff was throughout the year altogether too small to deal adequately with various aspects of agricultural development, and it was not possible to give the necessary attention and supervision to many districts.

In the Eastern Province, with its large cotton acreage, there was only one Agricultural Officer during the year, and for part of the period he also combined his duties with those of an Administrative Officer.

Some members of the staff, long overdue for leave, were, through the uncertainty of shipping, practically confined to headquarters towards the end of the year, ready to leave at short notice.

Weather conditions were generally unfavourable, and rain failure brought about famine in several districts and scarcity of food in all. The Northern Province suffered most in this respect, Chua District being especially affected, whilst later in the year the Eastern Province was faced with a situation almost as acute, and famine relief had to be resorted to in many parts. These conditions were also aggravated by epidemics; small-pox in Buganda caused considerable dislocation of trade, whilst later the influenza outbreak, which spread through the country, was responsible for a more general disorganisation.

Rinderpest by the end of the year had reached the cattle areas of Ankole in the Western Province, and caused heavy losses amongst the cattle.

Shortage of labour was a cause of anxiety on many plantations, and this was felt especially during the ripening and picking of the main coffee crop.

Shipment of produce was, under the circumstances, maintained satisfactorily, but it was only at the end of the year that it became possible to ship the accumulated stocks of coffee.

Exports.

Although the year has been an unfavourable one, as outlined in the preceding paragraph, it is satisfactory to note the increased value of the exports, and for the first time in the history of the Protectorate the export figures exceed a million sterling in value—*viz.*, £1,247,457, an increase of £462,764 over the previous year.

The full details and comparative tables are given in Appendices 9—12.

Cotton is, of course, the outstanding feature, and represents a value at port of shipment of £965,951, or 77·434% of the total. The amount of cotton actually exported is slightly less, by 1,207 cwts., than during the corresponding period last year, but the increased value is £428,868.

Coffee represents a value of £106,009, or 8·497%, of the total, and shews an increased value of £66,448 over the preceding year.

In the case, however, of cotton, the total exported at the 31st March does not represent the actual crop of the season under review in this report, as the close of the financial year finds exports at their height, whilst in the case of coffee the improved import and shipping facilities in the closing months made the export of accumulated stocks of the previous year possible, and these shipments mainly account for the increase, and level the decrease shewn in the previous year.

The principal products in the export table are represented by the following, and the percentage of each of the total exports is given :—

			£		
Ginned Cotton	...	27,492 bales of 400 lbs. each	965,951	=	77·434%
Coffee	...	54,311 cwts.	106,009	=	8·497%
Hides	...	15,053 "	64,125	=	5·140%
Ivory	...	94,795½ lbs.	37,918	=	3·039%
Ghee	...	6,443 cwts.	26,122	=	2·094%
Rubber	...	267,325 lbs.	13,513	=	1·086%
Other Produce	...	...	33,819	=	2·710%
			<u>£1,247,457</u>		

Cotton Crop.

A considerably increased acreage, especially in Buganda Province, was grown this year, and on several European coffee plantations too, notably in Bunyoro, cotton was made use of as a catch crop with satisfactory results.

The main crop is grown by natives, and the area may be estimated at between 140,000 and 150,000 acres.

The Eastern Province accounts for the largest share, but Buganda Province is steadily increasing its acreage, and the season's planting exceeded that of any previous year.

The Northern Province is making a more serious bid as a cotton producer, as, in addition to the Bunyoro crop of about 30 tons—almost all European grown—Gulu district produced nearly 100 tons grown by the Acholi and Madi tribes. It seems likely that Bunyoro, which had an estimated acreage of 2,000 under native grown cotton in 1910-11, may again take up its cultivation on a larger scale, as, following the lead of the planters who are proving that the crop is a profitable one in that district, the demand for seed for native planting next season, 1919-20, shews a considerable increase over recent years.

The following tables shew the distribution of the main cotton areas, with estimated acreages and output for the season under review :—

(a) Eastern Province :—

		Estimated Acreage.	Estimated crop in tons of Seed Cotton.
Teso District	...	45,000	3,070
Busoga "	...	28,000	5,000
Bukedi "	...	18,000	3,500
Lango "	...	13,000	1,750

Under favourable climatic conditions, such as prevailed in 1913-14, the crop should have been nearly twice as large, whereas Teso, which had an exceptionally unfavourable season, only averaged 150 lbs. of seed cotton per acre.

(b) *Buganda Province* :—

		Estimated Acreage.	Estimated crop in tons of Seed Cotton.
Mengo District	...	18,000	5,000
Entebbe "	...	3,500	1,000
Masaka "	...	4,000	1,400
Mubendi "	...	2,500	400

The season was more equable than in the Eastern Province, and except in the Northern sections of Mengo District, where the conditions were almost similar to those prevalent in Teso, yields were good and the cotton was, moreover, exceptionally white and clean.

In Bulemezi and Kiagwe, the best cotton areas in the Province, yields of 700-800 lbs. per acre were recorded.

The crop for the season thus reached approximately 34,000 bales, or about 8,000 more than the previous season.

Cotton Buying.

The buying season opened on 15th January in the Eastern Province and on 1st February in Buganda Province. In the former the season was short and the crop was quickly sold, whilst in the latter sales were much more prolonged, and buying extended over some months.

Quality and Ginning Percentage.

Despite the unfavourable conditions the quality of the cotton was well maintained, and when well ripened and carefully picked gave a very good sample, and prices for Uganda cotton in Liverpool have ruled high.

Slightly over 31% was obtained by one ginning firm in the Eastern Province as the lint percentage.

Largely on account of the dry weather, "stainers" were fewer than in previous years, and as a result the cotton was exceptionally free from stain. The annual burning of the old cotton plants is a great factor in keeping the crop free from serious pests, and makes it such a suitable one for native cultivators.

Legislation.

New Cotton Rules, under the Uganda Cotton Ordinance, 1908, came into force on 1st January, and provided for a system of licensed cotton buying posts as one of their main features. These posts, which took the place of markets, were established in all cotton areas in the Eastern and Buganda Provinces, and allowed for the continuous purchase of cotton instead of buying on fixed days only under the market system.

Posts are not permitted within five miles of an established ginnery and, being well distributed at various centres, full facilities were available to the grower for the disposal of his crop readily. Continuous buying as in previous years, was also carried on at ginneries.

The system worked well, but it is probable that the number of buying centres may be reduced in future, to confine them more to trade centres and nearer to, or on, main roads or waterways to facilitate transport.

Cotton markets were held in the Northern Province, and it is hoped that their establishment may have the same results in helping to build up the industry locally as they had in the Eastern Province in earlier years.

The Cotton Duty.

On 15th January, 1919, an Ordinance came into force whereby a tax of 4 cents per pound was imposed on all ginned cotton produced from seed planted in the Protectorate in 1918. A Committee, consisting of The Chief Secretary, The Director of Public Works, The Director of Agriculture, a member of (a) The Chamber of Commerce, (b) The Uganda Cotton Ginners' Association, (c) The Uganda Planters' Association, and (d) a representative of the Indian Community, was appointed by His Excellency the Governor to make recommendations as to the expenditure of the proceeds from the

tax. The money obtained is to be ear-marked for the development of the cotton industry, and will be devoted mainly to road construction and improvement in cotton producing areas, and for the establishment of two Cotton Seed Selection Stations in the Buganda and Eastern Provinces.

Ginneries.

There has been considerable activity in ginnery construction during the year, in spite of difficulties of obtaining, and cost of building materials, and the number of power ginneries now working amounts to 42.

Two ginneries were completed in Bulemezi County and two in Masaka, all of which are situated in Buganda Province. Others are under construction in various parts.

Cotton Seed.

The disposal of this product has again been a difficulty, on account of the lack of shipping space, but it is hoped that exports will soon be resumed on a normal scale.

Seed Distribution.

The distribution of seed for next season's planting is being conducted on a large scale, and there appears every prospect of a considerably increased acreage being planted.

Coffee.

This year has been a trying one on coffee plantations. Difficulty in obtaining sufficient labour has been a source of anxiety and this, coupled with import restrictions in the United Kingdom, scarcity of shipping, and prevalence of pests, of which latter Variegated Bug is the worst, have made conditions for planters severe. Transport has also been a problem, especially from the more outlying districts.

Considering the conditions the season's crop has been a good one on many estates, and the improved export facilities just at the close of the year altered the position favourably and enabled large shipments to be made, thus clearing off the accumulated stocks and getting the coffee home to benefit by the rising market. Prices tended to soar higher, and Uganda coffee has been in great demand. The gradual rise in the rate of exchange, however, coincided with these high prices.

It is estimated from available statistics that the acreage under Arabian coffee, cultivated by Europeans, is about 21,085, but in many cases the older trees are being cut out with the view to concentrating on Para rubber which had been interplanted.

Coffee has thus become more and more a catch crop in those parts of the country where rubber gives greater promise.

An interesting report on some *Coffea robusta*, selected and grown on the Government Plantation, Kampala, is given in Appendix 4.

A considerable area of coffee is grown by natives, but the crop at present receives very little cultivation.

The exports of coffee for the year are valued at £106,009.

Two coffee curing factories have been in operation during the year, one at Port Bell and the other near Kibanga Port, Kiagwe.

Coffee Advances Committee.

This Committee, alluded to in last year's report, dealt with a fair number of applications for advances, but the improvement in conditions after November altered the situation, and no further assistance was asked for after February.

Rubber.

Para rubber has come more to the front recently and is, on several estates, displacing coffee as the main plantation crop and continues to give good promise, and yields are reported to be satisfactory.

The acreage planted by Europeans is estimated at 11,255, mainly interplanted with coffee, but later plantings have been considerable and so the tappable area is still small.

The exports of plantation rubber for the year amount to 253,063 lbs., valued at £12,893, which shews a steady increase of 108,336 lbs. over the previous year, and an increase in value of £2,928.

Bark diseases have been rather more prevalent, and are under observation.

In the report on the Botanic Gardens, Entebbe, details and figures are given shewing results being obtained from trees of various ages up to 14 years, and the systems of tapping employed.

Large numbers of Para plants and seeds were issued during the year from the Government Plantations.

Natives are also responsible for a fair acreage of Para, and several of the bigger chiefs are tapping, whilst the acreage of Ceara rubber planted throughout native villages is considerable, but hardly any of this is at present tapped.

Cacao.

This crop makes little progress, and is not regarded with much favour by planters. Some good cacao has, however, been produced on a few estates, but by comparison with rubber and coffee it attracts little attention.

Diseases and pests are very troublesome on this crop in Uganda.

The exports for the year are 209 cwt., valued at £331.

Miscellaneous Crops.

Under this heading the following can be included:—Rice, maize, sugar, wheat, tobacco and tea.

Under the conditions prevailing it has not been possible to give much time to these crops, but all promise to repay attention, which they will receive when circumstances permit.

Rice cultivation has increased whilst sugar and maize are both easily raised crops, and the latter is already extensively grown as a native food crop.

In addition to the foregoing, large acreages under native food crops include plantains, sweet potatoes, millets, beans and peas, and estimated acreages are given in Appendix 2.

Oil Seeds.

Simsim, ground nuts, and to a lesser extent castor seed, figure in the exports and represent values of £1,008, £562, and £468 respectively. Cotton seed has already been referred to.

Of the three mentioned above, the ground nut is especially important as a crop to rotate with cotton. Markets were instituted in Teso with the object of encouraging its sale. New varieties are also under trial, and endeavours will be made in the near future to increase the acreage and stimulate its production.

Ploughing.

The popularity of ploughs amongst natives in the Eastern Province has been well maintained, and their use is extending. Ploughs are eagerly bought, and are often bespoken months before they arrive.

Considerable numbers of cattle are sent in for training to the Department's ploughing school in Teso.

Government Plantations.

These include (1) Kampala Plantation, devoted mainly to plantation crops—rubber, coffee, tea and cacao; (2) Botanic Gardens, Entebbe, which contain the oldest Para and cacao in the country and where, in addition to experiments on the above, various economic and decorative plants are raised and different varieties of fruits propagated; (3) Simsa Plantation, Soroti, for cotton seed selection work and native food crops; (4) Kakumiro Plantation, Mubendi, where rubber and *coffees* are mainly grown; (5) Toro Plantation, for coffee, tea, and wheat, etc.

Reports on these Plantations, giving details of the work done, are enclosed.

Veterinary.

The report of the Chief Veterinary Officer is enclosed, which gives details of the work of the Veterinary Division for the year.

Entomological.

The report of the Entomologist is enclosed.

Botanical.

The Botanist being absent on military duty until almost the end of the year, the work has been at a standstill.

Imperial Institute and Kew.

Various samples have been reported on by the above, and thanks are due to the Directors for their kind assistance.

Conclusion.

I have to record, with deep regret, the death in France on the 9th June, of Mr. Tyrrell Bruce, Senior District Agricultural Officer, from wounds. He had been on military duty since the outbreak of war—for three years in the local campaign, and latterly attached to the Machine Gun Corps in Europe.

Thanks are due to all members of the Department for their work during the year.

L. HEWETT,

*Acting Director of Agriculture,
Uganda Protectorate.*

ANNUAL REPORT ON THE GOVERNMENT PLANTATION, KAMPALA.

Mr. Halkerston, Assistant District Agricultural Officer, took over the Plantation during June, 1918, and was nominally in charge from that time until he resigned in January, 1919.

Mr. Snowden, District Agricultural Officer, was in charge from that date until the end of the year, whilst waiting to go on leave.

Labour.

The supply fluctuated considerably during the year, especially during the influenza epidemic. The famine also had a detrimental effect, as vitality was low, and had arrangements not been made to supply "posho" it would have been exceedingly difficult to carry on.

Meteorology.

The weather conditions during the period covered by this report were almost hopeless from an agricultural point of view, and were much worse than the conditions prevailing at Entebbe.

Planting was a very unsatisfactory business, and the crops which had been planted previously, and had not got thoroughly established, suffered considerably.

The tables below give the comparative rainfall figures for the last six years and the monthly average shade temperatures for 1 year:—

Rainfall: Comparative Records for Six Years.

MONTHS.	1913—14		1914—15		1915—16		1916—17		1917—18		1918—19	
	No. of days.	Inches	No. of days.	Inches	No. of days.	Inches	No. of days.	Inches	No. of days.	Inches	No. of days.	Inches
April ...	24	10·16	18	6·60	14	5·60	15	4·68	19	8·63	19	5·41
May ...	20	5·06	15	3·85	18	4·56	17	4·81	18	8·10	13	4·93
June ...	13	2·17	16	5·14	14	4·33	17	3·22	12	4·46	11	3·29
July ...	11	2·61	12	5·43	6	·36	5	·87	3	·23	4	·89
August ...	7	·83	14	5·50	10	2·77	15	2·58	14	4·29	12	4·55
September ...	8	3·50	18	5·12	12	4·52	16	9·46	16	8·58	10	3·47
October ...	20	1·78	19	5·43	14	5·23	15	4·60	12	5·33	14	2·64
November ...	20	3·80	26	8·00	18	6·33	12	3·13	4	1·60	12	1·50
December ...	12	2·96	6	·55	13	3·84	10	5·42	6	·52	7	1·79
January ...	9	3·63	5	·69	10	·81	13	3·54	8	1·37	2	·05
February ...	9	1·63	12	4·90	11	4·90	17	6·14	4	·56	12	8·97
March ...	20	3·81	15	4·01	15	4·40	7	4·18	11	1·97	12	8·18
TOTALS ...	173	41·94	176	55·22	155	47·65	159	52·63	127	45·64	128	45·67

Monthly Average Shade Temperatures, 1918-19.

MONTHS.	7 A. M.		2 P. M.		Maximum Temperature.	Minimum Temperature.	Highest Maximum Tempera- ture.	Lowest Minimum Tempera- ture.
	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.				
March	65.8	64.8	76.1	71.1	78.8	63.2	81.0	61.0
April	65.1	64.0	76.3	71.7	77.8	63.3	82.0	62.0
May	64.8	63.8	76.0	70.8	77.6	63.3	80.0	61.0
June	65.7	64.0	76.3	72.0	78.2	64.6	83.0	60.0
July	64.9	63.4	75.1	70.1	78.0	64.5	85.0	62.0
August	65.9	64.0	78.7	71.6	72.0	65.3	87.0	63.0
September	66.8	64.7	80.4	73.0	85.0	66.3	89.0	64.0
October	66.2	64.7	82.3	75.5	85.9	66.2	82.0	64.0
November	67.2	65.7	83.6	67.0	79.1	68.5	93.0	63.0
December	69.5	67.3	85.5	78.1	86.7	69.5	96.0	65.0
January	68.6	67.1	80.7	75.3	83.0	61.0	93.0	58.0
February	69.2	67.2	80.1	75.9	81.0	66.0	90.0	63.0

Distribution of Plants and Seeds.

The following were distributed during the year:—

PLANTS.				SEEDS.	
Economic. 1,000	Decorative. 426	Para. 15,750	Para. 53,000	Various. 647 lbs.	Packets. 22

The 647 lbs. of seeds were made up mostly of "Hickory King" maize for sowing purposes.

Coffea Arabica.

The adverse weather conditions already commented on were entirely against the coffee crop and responsible to a large extent for the low yields. In addition there were several waves of "Bug" (*Antestia orbitalis*, var. *faceta*), which added their quota of destruction and further reduced the crop.

With the "Bug" picking was resorted to as being the best means at present of keeping down their numbers and reducing their evil effects. During the worst period 1,000 bugs were collected daily, over an area of roughly three acres. They were more evident by the numbers during June, July, August, and December of 1918 and February of 1919.

Yields:—The following table gives the yields of seven of our principal plots, and shew their fluctuations over a period of five years. It shews also the treatment the plots have had from time to time.

This five years' period has seen, first, the advent of "Leaf Disease" (at least it was not until 1914 that its full effects were felt, although it appeared earlier), secondly, "Die-back," and thirdly, *Antestia*. They have all been present to a greater or less extent since they first made their appearance, and the trees have had to contend with, if not three, at least a combination of two pests at various periods.

Plots 6 to 13 were all "parrot-sticked," i.e., the primaries were all cut back to three and four inches from the main stem. They were all treated in a like manner, irrespective of whether the trees were well furnished with primaries or not, and, notwithstanding the fact that a long drought had prevailed, and was still prevailing (January, 1919), the trees flushed remarkably well and have made good growth since the onset of the rains. In those cases where the tree still possessed all its primaries the new growth is well distributed, but where such is not the case gormandisers have grown up out of the lost primary area. Stumping is undoubtedly preferable in dealing with these trees. Incidentally this pruning has got rid of much of the "bug" pest for the time being, for all the prunings were burnt, and in so doing numerous bugs and their eggs were destroyed.

Coffea Arabica. Nyasaland Variety.

No of Plot		Total Yield of Parchment Coffee.					Average Yield of Parchment Coffee per Tree.					Remarks (Treatment).								
		No. of Trees in Plot.		Previous Records.				Present Record	Previous Records.								Present Record.			
				1914-15	1915-16	1916-17	1917-18		1914-15	1915-16	1916-17	1917-18	1914-15	1915-16	1916-17	1917-18		1913	1914	1915
1		716	lbs. 287½	lbs. 237½	lbs. 648	lbs. 15	lbs. 399	oz. 6.4	oz. 5.3	oz. 14.45	oz. .335	oz. 8.9	Manured with Basic Slag and Cow Manure	—	Manured with Egyptian Phosphates	—	—	All Irregular Trees Stumped	—	All Irregular Trees Stumped
2		1,169	108	168½	773	77	265	1.45	2.3	10.58	1.053	3.6	—	—	551 Trees Stumped	—	—	do	—	—
3		1,386	138½	269	612	15	655	1.61	3.1	7.75	.107	7.75	—	—	—	—	—	do	—	—
4		724	251½	775	100	Nil	285	5.44	17.12	2.21	Nil	6.2	—	Manured with Cotton Seed. 21 lbs. per Tree.	Manured with Liquid Cow Manure, previous to crop ripening to 3'	Mulched with Lemon Grass. Stumped to 3'	—	—	Severely Pruned March, 1919	—
5		305	100	196	342	Nil	88	5.00	10.28	17.94	Nil	4.6	—	—	—	—	—	do	—	—
6		610	—	546	495	Nil	131	—	14.32	12.98	Nil	3.4	Manured with Basic Slag	—	Severely pruned	—	—	do	—	“Parrot sticked” Jan., 1919
7		544	—	584	406	Nil	88	—	18.1	11.83	Nil	2.5	—	—	Severely pruned	—	—	do	—	do

Plots 1—3 (8½ years old).
 " 4—5 (7 " "
 " 6—7 (7 " "

Coffea Robusta.

The yields from our three plots, *viz.*, 1, 2, and 3, shew a considerable drop as compared with the previous year. This is entirely due to the lack of rain, for much of the crop did not ripen.

Plot No. 1, which contains some good types of coffee—*vide* Annual Report 1917-18, page 18—gave a substantial yield during the year 1917-18, but this has not been maintained. The year under review, however, has not provided a good test for any crop, unless in so far as it might have shewn up any drought-resistant types existing, but all the *Coffeas* were on a par in respect to the effect of the drought.

C. excelsa, which is much the stronger, larger, and more tree-like of the *Coffeas* suffered, if anything, more than the others, for the young branches dropped so much that the undersides of the leaves became exposed to the sun and were severely burned.

These plots of *robusta*, however, picked up wonderfully well after the drought subsided, and this remark is applicable to all the *Coffeas*, but there was an absence meantime of the production of young wood, which affected yields towards the end of the year, and will no doubt affect them for some time to come.

The existence of considerable variation among the trees in Plot No. 1 has been mentioned in previous reports. Those which are more liable than others to throw out laterals have proved the more profitable trees, and they are largely responsible for the yields during the year. They are also further on the way now to producing a crop than those whose primaries are long, bare, and with a few inches only of bearing wood towards the apices.

These remarks are applicable, but to a less extent, to Plot No. 3—the Bwamba type.

The following are the yields:—

Coffea Robusta.

No. of Plot.	Origin of Plants.	Date Trees Planted.	No. of Trees in Plot.	Total Yield of Parchment Coffee.			Average Yield per Tree of Parchment Coffee.			Remarks.
				1916-17	1917-18	1918-19	1916-17	1917-18	1918-19	
1	Toro or Congo	March, 1914.	190	lbs. 381	lbs. 855	lbs. 163	lbs. 2	lbs. 4.5	ozs. 13.68	12' x 12' apart.
2	Local	Sept., 1914.	246	Nil	160	20	Nil	ozs. 10.48	ozs. 1.3	12' x 12' and 15' x 15' apart.
3	Bwamba Forest	May, 1915.	160	Nil	307	51	Nil	lbs. 1.92	ozs. 5.1	12' x 12' apart.

The Mukona Forest *Coffea*, the Bwebza, Canephora, Mubendi, and Quilou (all types of *C. robusta*) produced small crops during the year, but none of them are as yet fully grown. They are, however, very interesting types.

Small plots of *robusta*, progeny of trees Nos. 4, 5, and 20 of Plot No. 1, were planted out during the year, also a small plot of *Coffea bukobensis*, V. *Sombre Woelve*, from Java.

Coffea Excelsa.

These plots were bearing during the year, but the yields are still negligible. There are three sets of trees, all from Java. Plot 1 (Culture No. 2) contains trees of a free and luxuriant growth, but coarse, whilst the trees in Plots 2 and 3 (Plyndel, Nos. 1 and 2) are of a more congested habit, some of them resembling in a remarkable way the Liberian *coffea*, to which class the *excelsa* belong, especially those trees with several stems. Others are small trees producing many laterals and yielding freely. So far, however, the *excelsa* does not offer many attractions. They are less productive than most

other types, age for age and size for size, and it would appear that if *C. arabica* is to be superseded in these parts by another type, it will be by one or other of the *C. robusta*, for they cannot be beaten for prolificacy, and, since there is such a diversity among the types of the latter, it would seem merely a case of selection in order to produce a good all-round marketable bean. The yields are as follows:—

Coffea Excelsa.

No. of Plot.	No. of Trees in Plot.	Date Planted.	Distance Apart.	Total Yield of Parchment Coffee.	Average Yield per Tree of Parchment Coffee.
1 (Culture No. 2)	195	Sept., 1915	15' x 15'	lbs. 90	ozs. 7.39
2 (Plyendel 1)	120	Sept., 1915	15' x 15'	26	3.47
3 (Plyendel 2)	65	Sept., 1915	15' x 15'	4	1.00

Para Rubber.

The rubber tapping yields are given fully in the tabulation below. Unfortunately an exact comparison cannot be made between 1918 and 1919 yields, as those for 1918 do not extend over a complete year but merely for 11 months and 10 days in the 25 tree series, and for 10½ months in the 50 tree series. When comparing yields, therefore, a small advantage must be allowed to the 1918 figures.

This year's yields are not so high as they ought to be, considering the longer period of tappings, but had weather conditions been normal the yields would have been higher.

It is encouraging, however, that they are so good as they are under the circumstances, and that they were maintained so well for so long. They were fairly low, however, during January and February. During this latter period the trees were carrying an abnormally heavy crop of seed.

The daily records of trees not yielding were kept in each case, and the monthly averages are shown against each series, as is also the average of each series for the year. These records have shown that it is the same set of trees which are poor yielders, and some trees are recorded daily as not yielding for long periods, others for shorter periods. In comparing the various yields these facts must be borne in mind.

The table is a fairly comprehensive one as regards systems of tapping, as it contains most of those in vogue at the present time. Series 5 and 6 (the superposed cut), will no doubt entirely lose favour, and the choice of a system lies in one or other of single cuts. In making comparison of the daily and alternate day tapping we have, in series 12 and 13, one cut on ½ surface, a difference only of 4.7 oz. in favour of the daily cut. The daily system in this case, however, is at a disadvantage in having 3.07 trees as non-yielders, but in any case the yield is not proportionately higher in view of the amount of bark used up, and this is an important matter in comparing an alternate and daily paring. This is also borne out, but not so forcibly, in most cases, in making a comparison of the one ½ cuts and the one ⅓ cuts. Taking series 3, 4 and 11 (½ cuts) and series 7, 8 and 9 (⅓ cuts) there is a difference in the yields in favour of ½ cuts of 7.94 oz., 4.77 oz., and 4.96 oz. respectively.

Taking the paring as a whole there is certainly an improvement during the year, but there have been 12 different tappers on the series and this has prevented a high level of paring being reached. Confidence gained by practice is the only means of getting uniform paring and yields.

Bark renewal is very good all round. "Bark-rot" has been almost entirely absent—a result of the dry weather—and the general health of the trees is excellent. During their first years of growth, up to about the fifth year, their growth and general appearance was far from encouraging, but since then their growth has been remarkable.

The following are the records of yields :—

Para Rubber—Tapping Experiments.

No. of Series.	No. of trees in Series.	Present girth measurement at 3 feet.	System of tapping.	Previous No. of Partings.	Previous Total Yield of Rubber.		Previous Average Yield of Rubber per Tree.	Present No. of Partings.	Total Yield of Rubber.		Present Average Yield per Tree.	Total No. of Partings to date.	Total area of Bark excised.	Average No. of Partings per inch.	AVERAGE NUMBER PER MONTH OF NON-YIELDING TREES.												Average for the year of non-yielding trees.	REMARKS.
					lbs. oz.	oz.			lbs. oz.	oz.					April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March		
1	25	23-7"	V. $\frac{1}{2}$ surface alternate days	146	20 2	13	154	25 0	16	300	17"	17-64	1	1	1	3	4	2-4	2	2-5	2	2-25	3-71	2-26	Changed over to opposite side every six months.			
2	25	22-3"	V. $\frac{1}{4}$ surface alternate days	147	15 2	9-06	155	16 0	10-24	20	302	15"	20	1	1	1	2-23	3-6	4	3-2	2	1-85	3-2	4		3-5	2-55	
3	25	23-6"	1 cut $\frac{1}{2}$ surface alternate days	147	22 15	14-7	155	28 14	18-05	302	18"	16-77	1	1	1	3	2-77	2-3	1-43	1	1	1-8	1	1		1-44		
4	25	24"	1 cut $\frac{1}{2}$ surface alternate days	152	21 12	13-9	150	24 12	15-84	302	15"	20	1	1	1	1	1-14	1-54	1-77	2	2	1-84	2	2		1	1-52	
11	50	23-2"	1 cut $\frac{1}{2}$ surface alternate days	137	31 10	10-1	155	37 14	12-12	292	19"	15-36	1	1	1	92	1-46	1	1-66	1-5	1	1-25	1-14	1-5	2-4	1-32		
12	50	25-4"	1 cut $\frac{1}{2}$ surface alternate days	150	35 12	11-4	142	40 15	13-1	292	18"	16-02	1	1	1	1	2	4-3	Nil	Nil	Nil	Nil	8	1	1-23	1-02		
13	50	24-3"	1 cut $\frac{1}{2}$ surface daily	233	50 13	lb.	332	55 10	17-08	565	25"	22-06	1	1	1	955	4-91	4-37	2	2	2	2	2-07	3	3	3-07	-	
5	25	24-7"	2 cuts $\frac{1}{2}$ surface alternate days	147	23 14	15-3	156	23 0	14-72	303	14"	27-14	1	1	1	1	Nil	3-6	2	2	2	2	1-08	1-9	2	1-42	Changed over to opposite side every six months.	
6	25	25-6"	2 cuts $\frac{1}{2}$ surface alternate days	151	22 5	14-03	152	23 0	14-72	303	21"	14-43	1	1	1	1	92	2	2	71	Nil	Nil	14	Nil	Nil	73		
7	25	25-3"	1 cut $\frac{1}{2}$ surface alternate days	147	16 2	10-03	156	16 8	10-56	303	17"	17-81	1	1	1	1	3	Nil	Nil	Nil	Nil	1-75	1-83	1-84	97	Changed over to opposite side every six months.		
8	25	24"	1 cut $\frac{1}{2}$ surface alternate days	151	16 3	10-03	152	17 6	11-12	303	22"	13-77	1	1	1	1	1	Nil	Nil	Nil	Nil	Nil	Nil	15	3-42			
9	50	24-6"	1 cut $\frac{1}{2}$ surface alternate days	137	16 2	5-16	153	22 6	7-16	292	17"	17-17	1	1	1	92	4-1	4-14	4	4-2	4-68	1-53	6	5-3	3-41	Changed over to opposite side every six months.		
10	50	24"	1 cut $\frac{1}{2}$ surface alternate days	140	19 0	6	152	30 15	9-9	292	14"	20-85	1	1	1	12	1-61	1-92	2	2	2-25	2	3-58	3-53	1-9			
14	50	24-6"	1 cut $\frac{1}{2}$ surface alternate days	231	38 8	12-03	334	60 10	19-04	565	19"	21	1	1	1	96	2-48	3	3	3	3-5	3-08	1-9	2-1	2-23		2-27	

NOTE:—The trees were planted in 1910.

Cacao.

The record of yields from the numbered trees were destroyed during a burglary in the office, so that they are not available for this report. This is extremely unfortunate as they extended over a period of six years.

The old plots, it should be remarked, have never looked better, and during the recent rains the trees have put on remarkable growth.

These plots are all, with the exception of one, under Para shade, but it will be necessary sooner or later to sacrifice the Cacao or to thin them out to a very large extent, as both crops have been planted too close.

The younger plots, four of one acre each, of four varieties, are now in bearing and will take the place of the old ones for experimental work.

Wheat.

The results given below are from two separate sowings, *viz.*, February and August, 1918. They were both sown with the onset of the rains, and it would seem necessary to sow early in order to get a quick vegetative growth, for all our late sowings have been severely rusted. Indeed some of them were a complete failure.

Variety.	Sown February, 1918		Sown August, 1918.	
	Amount sown.	Amount reaped.	Amount sown.	Amount reaped.
	lbs.	lbs.	lbs.	lbs.
Pusa No. 6.	18	51	12	51
Pusa No. 4.	12	47	47	121
Pusa No. 12.	5	21	5	12

Sweet Potatoes. *Batatas edulis*.

As many as 15 varieties are recognised by the native, probably more.

These varieties, 15 in all, were collected during the year for test purposes. There were not sufficient stocks of vines, however, to make tests of all the varieties, but 10 plots of $\frac{1}{2}$ acre each were laid down towards the end of the year. The yields from these are of course not available for inclusion here. The table below, however, gives various data, as far as they are available at present, concerning these varieties, which may prove of some value. The yields of starch are interesting, as they show considerable differences in the starch content of the varieties. They are as accurate as it is possible to get in hand method of preparation. Samples of the starch are being sent to the Imperial Institute for report, so that we shall be able to arrive at the food value of the several varieties.

The natives prefer Var. No. 2, "Kiwoko," as it is the best edible tuber. Var. No. 6, "Mugowa" comes next, but for early maturity and heavy cropping Var. No. 1, "Magabali" is the best, and it is the variety largely planted after the subsidence of drought and during times of scarcity. It is not so palatable, however, as the two former varieties.

Those described as fibrous and slightly fibrous in the table should not be looked upon as being undesirable varieties, for in none of them is it a disagreeable character, for the fibres become disintegrated in the cooking and are only perceptible when the tuber is broken transversely, when they are seen to project slightly.

Sweet Potato. *Batatas edulis* syn. *Convolvulus batatas*.

Variety Number	Native Name	Description of the Plant		Tuber Boiled	Yield of Starch from the several Varieties				Remarks
		Leaf	Tuber		Weight of Tuber when fresh	Weight of Starch (dry)	Weight of Residue (dry)		
1	Magabali ..	Entire, mid-rib and veining (underside only) purple.	Mostly globose, white, with faint tinges of purple in places, slightly laticiferous.	Sweet, creamy white, context cheesy, surface slightly fibrous.	lbs. 50	lbs. ozs. 3 10	lbs. ozs. 7 0	There is little or no difference among these varieties as regards the growth of the vine. They are all strong and vigorous.	
2	Kiwoko ..	Large with 4 or more incisions, mid-rib and veins at the junction of petiole only, purple.	Long, proportionately thick (largest of any of the varieties) white with faint tinges of purple, some of tubers have longitudinal splits, slightly laticiferous.	Sweet, white, context fibrous, mealy.	50	3 1½	7 8		

Variety Number	Native Name	Description of the Plant		Tuber Boiled	Yield of Starch from the several Varieties				Remarks
		Leaf	Tuber		Weight of Tuber when fresh	Weight of Starch (dry)	Weight of Residue (dry)		
3	Kifeje ..	With 4 or more incisions, mid-rib and veins purple.	Comparatively long and proportionately thick, purple, slightly laticiferous.	Sweet, context cloudy white, slightly mealy.	lbs. 50	lbs. ozs. 2 3	lbs. ozs. 7 8	There is little or no difference among these varieties as regards the growth of the vine. They are all strong and vigorous.	
4	Ngelozachwa	With 4 or more incisions, mid-rib and veining (underside only) purple.	Long and narrow with some short and thick, some with longitudinal splits, slightly laticiferous.	Sweet, context cloudy white, slightly fibrous and slightly mealy.	50	2 8	7 0		
5	Munyolya ..	With 4 or more deep incisions. Junction of leaf with petiole only, purple.	Long and proportionately thick and some almost globose. White with faint tinges of purple around the eyes, considerably laticiferous.	Sweet, context cloudy white, slightly fibrous and slightly mealy.	50	2 8	7 11		
6	Mugowa ..	Entire, mid-rib (underside only) purple, veining with purple tinge.	Smooth (notably), long and fairly narrow, light purple, slightly laticiferous.	Sweet, context white, slightly fibrous, mealy.	50	2 8	8 0		
7	Nakamogoli	With 4 or more incisions, mid-rib and veining (underside only) purple.	Long and narrow, purple, some with longitudinal splits, slightly laticiferous.	Sweet, context cloudy white, slightly fibrous, mealy.	50	2 8	10 0		
8	Nakitembe	With 4 or more deep incisions. Junction of leaf with petiole only, purple.	Short, thick, almost globular, white with faint tinges of purple around the eyes, considerably laticiferous.	Sweet, context white, slightly fibrous, mealy.	50	2 3	6 8		
11	Nsenjebekere	With 4 or more incisions, mid-rib and veining purple.	Long, mostly narrow, purple, very similar to No. 3.	Sweet, context white, slightly fibrous, mealy.	50	2 0	10 0		
12	Buwala ..	Entire, entirely green.	Long and narrow (comparatively) white.	Sweet, context white, mealy.	50	3 0	8 10	Vine slender	

Sugar Cane.

We were concerned merely with keeping up the stock of cane during the year, for it was not possible, as was contemplated, to put down 1 acre or $\frac{1}{2}$ acre plots for testing the cane yields of the various types. With the exception of the Uba variety, which the natives do not care for, the bulk of the cane was sold to natives as food, and this proved a great boon during the famine. 18,907 canes were sold in this way, and 2,699 to planters as sets.

General.

Another plot of tea was planted out and interplanted with Pines. The plot was mulched with lemon grass.

Several plots of maize, "Hickory King," and "Yellow Hogan," were sown, and selected; also beans—bush lima, haricots, phaseolus, etc.—and buckwheat.

Conclusion.

There is much experimental work waiting to be undertaken but owing to shortness of staff it has of necessity been merely a case of carrying on, and intensive experimental work has had to be left over.

T. D. MAITLAND,
District Agricultural Officer.

ANNUAL REPORT

ON THE

GOVERNMENT PLANTATION, SIMSA, SOROTI.

The weather conditions throughout the past year were the driest on record, and experimental work with other crops than cotton was a failure. Owing to the fact that there were no reliable rains, any crops that needed to be transplanted as seedlings were killed off before they had a chance of gaining a hold.

TABLE No. I.

Rainfall.

Month	1914-15		1915-16		1916-17		1917-18		1918-19	
	Rainy days	Inches	Rainy days	Inches	Rainy days	Inches	Rainy days	Inches	Rainy days	Inches
APRIL	11	3.77	19	8.77	12	6.72	18	11.44	10	4.56
MAY	14	7.50	18	7.52	16	4.51	23	12.12	13	4.86
JUNE	15	5.48	10	2.82	14	6.02	13	2.59	13	3.70
JULY	13	4.73	5	2.09	9	1.06	4	1.30	8	3.61
AUGUST	16	5.18	8	3.55	17	10.37	13	11.00	16	7.34
SEPTEMBER	14	7.95	18	5.49	15	7.71	13	5.75	9	2.74
OCTOBER	20	5.85	14	4.43	11	4.98	18	11.84	7	2.60
NOVEMBER	21	11.70	14	9.36	11	7.04	3	1.42	10	5.67
DECEMBER	3	.36	12	3.51	6	3.14	2	.68	4	.75
JANUARY	...	...	4	.83	10	3.32	2	.26	1	.14
FEBRUARY	...	...	11	2.25	11	3.47	1	1.05	8	3.68
MARCH	9	6.02	10	3.31	3	1.45	4	1.18	8	3.70
TOTALS	...	58.54	...	53.93	...	59.79	...	60.63	...	43.35

TABLE No. II.

Temperatures.

Month.	Average Maximum	Average Minimum	Highest Recorded	Lowest Recorded.
	o	o	o	o
APRIL	89.4	64.3	94	63.5
MAY	87.8	65.1	91	63
JUNE	87	64	92	60
JULY	88.2	65	88	62
AUGUST	87.4	63.4	91	62
SEPTEMBER	89	63.8	95	60
OCTOBER	93.4	63.5	99	61
NOVEMBER	92.8	65.8	99	64
DECEMBER	95	64.7	99	60
JANUARY	97	67	102	64
FEBRUARY	92.1	68.5	105	64
MARCH	92.7	69	104	66

Cotton Seed Selection and Propagation.

The main cotton crop on the plantation was composed of two varieties:—Sunflower No. 7 and Nyasaland No. 32—the former 25 acres and the latter 10 acres.

Cotton sowing commenced on May 8th but shortly afterwards a dry spell set in and further sowing was delayed. Rains again commenced at the end of June when further blocks were sown and by the end of July 50 acres had been sown with cotton and 7 acres with food crops.

Heavy storms on the 4th and 21st August did much damage to the early sown cotton and caused a heavy falling of squares. This must have considerably affected the yield, which has not been satisfactory.

Picking commenced on the May sown cotton in September, and although there had been spasmodical heavy showers these did more harm than good, as in the intervals the sun had been scorching. This resulted in much premature bursting of bolls and a somewhat high percentage of immature fibre.

About this time (September) Aphis blight was very prevalent, but it is interesting to note that the Nyasaland (32) resisted this pest until later in the year and showed a good stand of plants well balled.

The autumn rains failed entirely and consequently late sown cotton suffered, the plants showing no fresh growth and there was no second picking.

Advantage was taken of the dry periods to have all roads on the plantation cleared and formed. A new cotton store and office were erected during the year.

Selection Experiment Plots.

Plots of one acre each were sown with 8 of the best selections of the previous year and also 3 of the best selections of year 1916-17 for further experiment.

Good results were obtained from some of these, although the yield was small owing to the dry season, as shown on Table III. attached to this report.

Individual Selections.

Twenty-one individual selections were made from the 1917-18 Kadunguru Plantation crop. These were sown in single rows and divided by belts of maize to prevent mixing.

A few of these did well as shown in Table IV. and they will be retained for further experiment next season.

Ginning Out-turn.

Ginning percentages were again variable. Only two of the ginners responded to our request for figures of ginning tests. One ginner gave results of two tests showing 30.44 and 30.07 percentage of lint respectively and the other ginner one test showing 29.48 percentage of lint—all with roller gins.

In the office however small tests made with numerous samples showed a variation similar to previous years of 26.4% to 31.6% or an average of 29.8% over all the tests.*

Kumi Plantation.

A small beginning was made at Kumi and an area of 10 acres was cleared and planted with cotton and food crops.

A plot of rice which was sown near to the swamp was a failure owing to the drought.

The cotton which was sown in June and July was fairly successful. The yield was not large but the quality of the cotton was excellent.

Ploughing Instruction.

A ploughing school was held at Kumi throughout the year and useful work was done in training boys and oxen sent in by chiefs in the district. The head ploughman was brought from Pallisa to Kumi to take charge of the ploughing school.

General Cotton Crop.

Teso District.

In Teso the drought of year 1917-18 continued till March 31st. This resulted in much re-sowing of the wimbe crop (originally sown in January) and consequent delay in preparation of the land for cotton. Bad weather conditions and shortage of hoes, together with the hard condition of the ground, did not help matters. In consequence the bulk of the crop was not sown until July and August (say 75%), about 25% having been sown in June.

In North Soroti about 450 acres were sown in May and the advantage of early sowing has been proved, as this early sown area gave a far heavier yield and the quality of the cotton was superior.

In North Usuku the cotton crop was an absolute failure and a partial failure in the remainder of the County.

In Serere County all the Lake shore areas, which had always given heavy yields in previous years, failed last year.

In the whole of Teso District the yield per acre of cotton was slightly under 150 lbs.

Lango District.

In the Kioga County of Lango District the conditions were more favourable, especially in the Luala, Pilitok and Kalaki area, where the natives had a very heavy yield.

The average yield per acre in the whole of Lango was about 300 lbs., and the quality was generally better than that of Teso District.

R. G. HARPER,
District Agricultural Officer.

TABLE No. III.

Report on the Examination of Cotton from Selection Experiment Plots.

No. of Plot.	Variety.	Yield per acre.	Average length of staple	Strength.	Ginning per cent.	Trans- mission.	REMARKS.
1 ($\frac{14}{1}$)	Sun- flower	180	1	Medium	28.1	Fair	Fine long staple, somewhat stained, seed small.
2 ($\frac{18}{16}$)	do	200	1	Medium	29.2	Good	Fine sample—very regular—seed very small.
6 ($\frac{18}{14}$)	do	270	1	V. strong	29.5	Very good	An excellent sample—fine long staple, very regular and strong.
8 ($\frac{25}{25}$)	Allen	185	1	V. strong	28.3	Good	Fine long staple, but somewhat wasty.
9 ($\frac{25}{29}$)	do	145	1	V. strong	30	Very good	An excellent sample, very regular and strong.
10 (30)	Nyasa- land	215	1	Medium	30.6	Poor	Staple short, weak and rather wasty.
11 (32)	do	265	1	V. strong	30.4	Very good	An excellent sample—fine medium staple, very strong and regular.
12 (32)	do	158	1	Strong	31.3	Fair	Staple irregular and rather wasty.
13 (18)	Sun- flower	285	1	Medium	30.1	Poor	Staple very irregular and wasty.
14 (18)	do	300	1 $\frac{1}{4}$	Strong	31.2	Fair	A good sample—free from stain.
16 (18)	do	285	1 $\frac{1}{4}$	Strong	29.4	Fair	Staple somewhat irregular and slightly wasty.

TABLE No. IV.

Report on the Examination of Individual Selection Plots.

No. of Plot.	Variety.	Diseases.	Insect Attack.	Average length of staple	Strength.	Regularity.	Percent- age of lint.	REMARKS.
1 ($\frac{14}{1}$)	Sun- flower	Much	Aphis blight	1	V. strong	F. regular	29.5	Seed medium sized and covered with fuzz.
3 ($\frac{18}{16}$)	do	V. slight	do	1 $\frac{1}{4}$	V. strong	V. regular	28.3	Somewhat stained and wasty.
5 ($\frac{7}{23}$)	do	V. slight	do	1 $\frac{1}{4}$	V. strong	Regular	27.4	Very silky and seed well covered.
7 ($\frac{7}{23}$)	do	None	Slight Aphis	1 $\frac{1}{4}$	F. strong	Regular	30.3	Good colour, seed small.
9 ($\frac{18}{14}$)	do	V. slight	do	1 $\frac{1}{4}$	Strong	V. regular	31.5	Good colour, seed small.
10 ($\frac{18}{14}$)	do	Much	Aphis blight	1 $\frac{1}{4}$	V. strong	V. regular	29.2	Stained and slightly wasty.
11 ($\frac{25}{27}$)	Allen	Much	do	1 $\frac{1}{4}$	Strong	F. regular	27.8	ditto
12 ($\frac{25}{27}$)	do	Much	do	1	Strong	Regular	28.6	ditto
14 ($\frac{25}{28}$)	do	Much	do	1	V. strong	V. regular	29	An excellent sample.
16 ($\frac{25}{29}$)	do	V. slight	do	1	Strong	F. regular	28.8	Slightly wasty.
17 ($\frac{25}{29}$)	do	V. slight	do	1 $\frac{1}{4}$	Strong	Regular	27	Rather wasty.
18 (30)	Nyasa- land	V. slight	None	1	V. strong	Regular	31.6	Good colour but rather short and harsh.
21 (32)	do	V. slight	None	1 $\frac{1}{4}$	V. strong	V. regular	31.5	An excellent sample.

All the above samples will be further experimented with.

ANNUAL REPORT

ON THE

GOVERNMENT PLANTATION, FORT PORTAL, TORO.

The Plantation was under the charge of a native headman until the end of November, after which date it was under the charge of a well educated Muganda overseer, who spent part of his time on the Plantation and the remainder inspecting native agriculture in the district, while the District Commissioner, Toro, helped in supervising the work as far as possible.

The Director of Agriculture visited the Plantation in August, and the District Agricultural Officer, Kakumiro, visited it in November and December.

Area.

There are eight acres under cultivation, of which 6·05 acres are under coffee. There has been very little extension during the year, the most important being the clearing of sites for a store and a house for the native overseer, both these buildings being completed towards the end of the year.

Nyasaland Coffee.

The trees have done very well, and this year there has been a very large crop—the first full crop of the 1915 trees, and a smaller crop of the 1916 trees. The work of harvesting this was much impeded owing to no coffee pulper being available, and some small loss may have been incurred on this account. It is hoped that a coffee pulper will be available in time for the next crop.

So far the trees have suffered very little from disease or insect attack. The “coffee bug” has not yet appeared in the district near Fort Portal, though a sharp look-out is being kept in order to check it should it do so.

The total parchment coffee picked up to the end of March is 2,889 lbs., the greater part of this being from the 3·67 acres planted in 1916.

Tea.

The trees, which were planted in 1915, are making excellent growth, and are now bearing seeds which are being sown in the nurseries in order to obtain plants for increasing the area, which is only ·35 acre, the number of trees being 136, as they are planted 10' × 10' instead of 5' × 5'. Judging by the growth of the trees there is every prospect of tea being a success in Toro, and no serious pest or disease has so far been met with, though it must be admitted that the area is a very small one.

Fruit Trees.

A small area, about ·14 acre, was planted up in November with a few of each of the following fruit trees:—Oranges, seedling figs, mangoes, loquats, and rose apples. A few of the following are in the nurseries and will be planted out in April:—Mulberries, oranges, grape vines, papaws, figs, and guavas. Peaches are doing well in the district and some of these trees, and also a few Japanese plums, should be procured.

Other Trees.

A few Para trees are growing slowly and are being left for the purpose of observing the rate of growth. *Grevillea robusta* and Eucalyptus trees are doing well. “Rain Trees” make very poor growth. A few Mlanji cedars were planted out in November, and seeds of *Casuarina equisetifolia* and *Cupressus macrocarpa* have been sown in the nurseries.

Miscellaneous.

A plot ·37 acre in area was sown with barley in September, but it was a failure, being badly “rusted.”

Wheat has been tried several times, but does not do very well. The altitude (5,000 feet) and the black, volcanic soil do not seem particularly suitable for cereal crops, and for experiments with these crops it would be better to open another station at a higher altitude—6,000 to 7,000 feet—where the soil is more of a reddish coloured loam.

A very small plot— $\frac{1}{12}$ acre—was sown with flax in November. One part did very well, being $3\frac{1}{2}$ ' in length, but the other was only a little under 2' long. The former was planted on land previously cultivated and consolidated, the latter on freshly cultivated land which had not settled. The need of a well consolidated seed bed for flax is well indicated, but the plot was too small to draw definite conclusions, and a larger plot will be sown in 1919. The yield was:—Straw 163 lbs., or 1,956 lbs. per acre; seed 26 lbs., or 312 lbs. per acre.

A few cuttings of three varieties of sugar cane have been planted, in order to raise a stock for distribution.

Seeds of maize, rice, cover crops, small millet, and ground nuts were received from Kakumiro, but too late to make use of this year as there was no ground ready for their reception. Arrangements have been made for these crops to be grown during the ensuing year.

Though some small progress has been made during the year under review, it is not to be expected that the best results can be obtained until it is possible to station an Agricultural Officer at Fort Portal.

J. D. SNOWDEN,
District Agricultural Officer.

ANNUAL REPORT

ON THE

GOVERNMENT PLANTATION, KAKUMIRO, MUBENDI.

From the 1st April to the 19th July the Plantation was under the charge of a native overseer, from that date until the 23rd January—when I was transferred to Kampala owing to ill health—I was in charge, but was away on safari about half that period.

The area under cultivation has been increased a little, and is now approximately 40 acres, half of which is under coffee.

The main avenue which, owing to the diversion of the Mubendi—Bukumi road, ended abruptly near the stores, has been now carried straight to the Bukumi road, and the borders will be planted with the Mlanji cedar, in continuance of the avenue of these trees which is such a notable feature at Kakumiro.

Rainfall.

The rainfall this year was below the average, and not very well distributed. June and July, except the last few days, were very hot and dry months, as was also January.

The following table gives the records for the last five years:—

MONTH.	1914-15.		1915-16.		1916-17.		1917-18.		1918-19.	
	No. of rainy days.	Inches.	No. of rainy days.	Inches.	No. of rainy days.	Inches.	No. of rainy days.	Inches.	No. of rainy days.	Inches.
APRIL	16	5.18	15	7.39	17	6.77	17	7.01	18	6.42
MAY	8	2.86	11	3.48	15	6.13	18	7.77	11	5.33
JUNE	10	3.50	7	1.63	5	2.03	11	3.64	7	0.86
JULY	9	3.07	5	3.22	8	3.92	4	0.93	4	2.47
AUGUST	10	4.95	7	4.62	12	4.67	15	4.74	14	6.16
SEPTEMBER	17	6.74	14	4.40	19	10.91	18	11.74	9	2.45
OCTOBER	20	8.16	12	8.09	14	7.00	19	11.26	16	5.93
NOVEMBER	21	8.71	15	5.22	13	3.44	5	0.94	11	4.52
DECEMBER	5	1.11	9	2.59	9	2.97	3	0.44	10	2.50
JANUARY	2	0.12	2	0.32	7	2.54	6	3.01	3	0.73
FEBRUARY	7	1.46	16	5.95	11	6.22	2	1.43	10	4.48
MARCH	12	4.38	9	3.91	8	1.90	9	2.80	7	5.32
TOTALS	137	50.24	122	50.82	138	58.50	127	55.71	120	47.17

Coffea Arabica: var. Nyasaland.

There has been no increase in area in this variety. The crop has been an exceptionally small one this year, owing to the prevalence of the "coffee bug" *Antestia orbitalis* var. *faceta*. Reference to previous records shows alternate good and bad crops, the figures for the years 1914-15 to 1917-18 showing respectively an average of 340, 568, 280 and 636 lbs. of parchment coffee per acre. A small crop was thus to be expected this year, but compared with the preceding years it may be termed a failure, the average yield being under 50 lbs. per acre.

The "bug" has been extremely difficult to eradicate, and, in spite of daily hand picking, is still present in small numbers in most of the plots. The trees planted in 1913, 1911 and 1904 have been heavily pruned, and the remainder will be similarly treated in due course, as where the branches are at all thick the detection of the "bug" is very difficult, and an occasional severe pruning removes all the young branches which have been damaged by the "bug" and rejuvenates the trees.

All the plots flowered well after the rains in February, and there are prospects of a good crop in 1919.

Coffeas: OTHER VARIETIES.

One acre plots of Bourbon and Costa Rica varieties have been planted with plants raised from seed obtained from the old trees on the Plantation. It is hoped that a comparison of these two varieties will prove useful. The two rows of Bourbon trees near the fruit plot have been cut out, with the exception of a few of the best trees near the top, as the soil was poor and they never did well.

A small plot of Nandi coffee is now doing well, as are also the few remaining trees of *Coffea stenophylla*.

There are now two acres of ordinary *Coffea robusta* established, one acre of which is in bearing. Seeds of various selected *Coffea robusta* have been received from the Kampala Plantation, and have been sown in the nurseries, and small plots of each will be planted out later. *Robusta* coffee is doing well at Kakumiro, but there are no useful records available at present.

There are only a few trees of *Coffea excelsa* planted out, and they are making excellent growth. Seeds have been sown in the nursery, and the size of the plot will be increased when the young plants from this sowing are available.

Shade Trees.

The *Erythrina umbrosa* trees continue to grow well, and are now giving fairly good shade. They were planted too far apart to give effective shade quickly. 40' × 40' is a good distance for the permanent trees, but other trees should be interplanted temporarily and then cut out. The trees flowered well but so far have not set any seed.

The *Albizzia moluccana* are also doing well, but have not yet been tried as shade for coffee, though seedlings are now being raised for that purpose, for which they appear very suitable.

Grevillea robusta do well planted along avenues and as wind-breaks, and are now being tried as shade for coffee.

The "Rain Trees" grow very slowly and so far do not look very promising, though they may eventually develop into good trees. *Adenanthera pavonina* is of very little use. *Leucaena glauca*, planted rather close, is being tried as a shade for *Robusta* coffee, but the plants are still small.

Rubber.

There are four acres of Para and one-tenth of an acre of Funtumia, which were planted in 1906, and $1\frac{3}{4}$ acres of Ceara which was planted in 1912. All three do well, but only the Para is being tapped. Tapping was commenced on 123 trees in Plot 7 on the 17th June, and on 138 trees in Plot 12 on the 16th August, all the latter trees had been previously tapped; a few of the former had not. At the end of September one tree in Plot 7 and two trees in Plot 12 were badly broken in a storm and were unable to be tapped afterwards, and are not included in the records from October onwards.

Particulars of the yields up to the end of November are given below:—

Group.	Age. Years.	No. of Trees.	Average Girth at 3'	Method of Tapping.	No. of Times Tapped.	DRY RUBBER, IN OUNCES.			
						Biscuit	Scrap.	Total.	Average per tree.
Plot 7	12	123 (122 from Oct.)	28"	1 cut on $\frac{1}{2}$ surface twice weekly.	48	1,596 $\frac{1}{2}$	225	1,821 $\frac{1}{2}$	14.83
Plot 12	12	138 (136 from Oct.)	29"	2 cuts on $\frac{1}{3}$ 20" apart. Twice weekly.	31	1,346 $\frac{3}{4}$	221 $\frac{1}{2}$	1,568 $\frac{1}{4}$	11.44

The cuts were to the left, at an angle of 45° . Tapping twice weekly, 104 tap-pings should be obtained in one year, so that the trees in Plot 7 should give an average yield of 32.13 ozs., and those in Plot 12 35.15 ozs.

Though the yields in Plot 12 are a little higher than those in Plot 7, it is doubtful if the increased yield is sufficient to counterbalance the increased area of bark excised, and the extra work entailed. Higher yields could no doubt be obtained by daily or alternate day tapping, but in a climate like Kakumiro, which is much drier than the districts near the lake, daily tapping would probably necessitate the trees being rested during the drier months. The yields obtained by tapping twice weekly have been very consistent and tapping can be carried out throughout the year, whilst fewer tappers are required.

It should be noted that the scrap rubber shown is only that which is collected from the collecting cups and tapping cuts, and does not include the bark parings, which cannot be treated as there is no machine for the purpose. Allowance should be made for this when comparing the yields with those of other plantations.

No bark diseases or pests were noticed during the year.

There was a good crop of seeds—25,000 to 30,000—most of which were disposed of to planters in the vicinity. Germination was in most cases reported to be excellent.

The young trees, planted at the end of 1915 among the 1906 coffee, are making good growth, and are of interest to neighbouring planters as showing more clearly the rate of growth than the old trees, which were somewhat neglected in their early stages of growth.

Tea.

The established trees continue to make good progress. Except for a few trees which are kept pruned for demonstration purposes they are being kept as seed bearers, and a fair amount of seed has been collected during the year, which has been sown in the nurseries where a good germination has been obtained and some hundreds of plants raised ready for planting out in April. The trees have kept very healthy and have not been troubled with any serious disease or pest.

Cacao.

This crop has made very little progress during the year. A few of the oldest trees will soon be in bearing, and plants raised from the seed thus obtained will be used to fill in the vacancies, and may prove better adapted to the climate.

Native Silkworm Trees.

These trees have been thinned out, but pruning was difficult owing to the trees having been left so long without it. As a result of there being very little young growth for the insects to feed on, the nests have not increased during the year, but with more attention paid to pruning better results are expected. Only a few pounds of nests have so far been collected and it seems doubtful if it will pay to cultivate the trees, but perhaps better to give more attention to the preservation of the nests in their natural habitat.

Fruit.

Practically all the trees are doing well, and, as many of them are now bearing, they are becoming useful for propagating purposes.

The following additions have been made during the year:—Figs, mangoes, grape fruit, loquats (six of each), and seven grape vines in five varieties.

Cover Crops.

Small plots of each variety continue to be grown in order to keep up a small supply of seed to meet demands, which up to now have not been numerous. *Tephrosia vogelii*, *Cassia hirsuta*, and *Leucaena glauca* continue to give the best results.

Two varieties of ground nuts—"Ceylon" and "Big Java"—were sown between the young coffee. They served their purpose well, but the yields were small owing to the damage done by crested cranes and porcupines.

Wheat.

Pusa wheats, Nos. 4, 6 and 12, were sown in April and gave fairly good results, the yields varying from 400 to 600 lbs. per acre. Seed sown at the end of August was a failure owing to unfavourable weather. Ordinary wheat sown on the Plantation, and also at Butologo, at the same time, was also a failure. Seed of each variety has been saved and will be sown in April, which appears to be the best sowing season for this district.

Rice.

The four varieties of rice from Mwanza, which were tried last year, were again given a trial, two plots of each being sown, one in the high parts of the Plantation and the second near the swamp. The former were a complete failure, and two of those near the swamp also failed. Sindano yielded at the rate of 802 lbs. per acre, and Bungali 560 lbs. per acre. It will be noticed that Karundi, which gave the best yield last year, was a failure this.

I am of opinion that rice will not do well in this district, unless grown near a swamp or stream, and, if possible, irrigated during dry weather. Experiments in this direction are now being carried out, six varieties having been sown in March in small plots near the swamp where they can be irrigated if necessary.

All the varieties of rice experimented with up to the present require a long season to reach maturity, in most cases eight to nine months, and for this reason do not meet readily with favour among the natives. What is wanted is a quick maturing variety which will ripen in four to six months.

Cotton.

One acre was sown at the beginning of August. The seed germinated well and growth was good, but the drought in December and January caused some of the young bolls to fall off. Picking commenced at the end of December and finished in March. The yield was moderate, being 310 lbs. of "A" quality, and 61 lbs. of "B" quality, or a total of 371 lbs.

Flax.

One-fifth of an acre was sown at the end of July. Germination was good and growth rapid. Some damage was done by heavy rains laying the straw. The crop matured and was pulled on the 18th October, or not quite twelve weeks from the time of sowing. The straw was mostly weak and short, averaging 2 to 2½ feet in length, and the yield was poor, namely:—Seed 28 lbs., or 140 lbs. per acre, and straw 207 lbs., or 1,035 lbs. per acre. There seems little prospect of flax being a success in this district, as the altitude is too low, but further trials will be made.

Miscellaneous Crops.

The following yields of a few miscellaneous crops may prove of interest. They are rather below normal:—

Name of Crop.	Area Planted.	No. of lbs. Reaped.	Yield per Acre.	Remarks.
Small Millet, Improved ...	·57 acre	314	550 lbs.	Very weedy.
Buckwheat ...	·16 „	128	800 „	
Native Beans ...	·30 „	204	680 „	
English Potatoes ...	·062 „	301	4,850 „	
				Attacked by disease on leaves.

Three varieties of maize, “Hickory King” “Yellow Hogan” and “Native” were grown, but particulars of the yields are not available as a lot of the cobs were sold to the labourers when “green.”

Seed of the millet and the two first-named varieties of maize have been distributed among the natives of the district with a view to improving the native food crops. There is much room for extension in this work by introducing improved varieties.

Three varieties of sugar cane are now established at Kakumiro. The sets first received were planted near the swamp, but cuttings from these have now been interplanted in part of the 1913 coffee, where root disease has been prevalent and the trees have never done well. The cuttings are growing well and the coffee will be cut out when necessary.

Touring.

Fourteen European estates were visited in Toro and ten in Mubendi District. Coffee continues to be the most important European crop in these districts, though near Mityana Para is coming into favour.

The wheat districts of Toro and Mubendi were inspected. In Toro wheat cultivation is now mostly carried on at an altitude of 5,500 to 7,000 feet, and the industry is firmly established, though there has not been much increase during the last year. There is a good demand for the wheat by traders who own either water or hand power grinding mills. Most of the flour obtained is sold locally or in the Belgian Congo. In Mubendi, on the other hand, the future of the industry is by no means secure. Most of the wheat is grown in the Butologo district at an altitude of about 5,000 feet, but during the year its cultivation has been extended to some of the hills near Mityana of about the same altitude, or rather less. Unless some good “rust-resistant” varieties can be introduced wheat is likely to prove an uncertain crop in this district, as the altitude is rather low.

There are two sowing seasons in the year in both districts, April and September, and the wheat matures in about four months. Crops vary considerably according to the climatic conditions. In Toro there seems little to choose between the two seasons, but in Mubendi the April sowing has so far given the best returns.

For the past two years the Butologo wheat has been bought by the Government at Mubendi, in order to help to establish the industry, but in future it is hoped that planters and traders will take an interest in the crop, and market it at Mityana, thereby reducing the cost of transport to Kampala, which is the most important consuming centre. The crop in Butologo for 1918 was about 5 tons, 3½ tons of which was bought by the Government at an average price of 6 cents per lb., and the remainder by Europeans in the district.

The cotton industry, which received such a check in the Mubendi District owing to the low prices prevailing at the commencement of the war, has now regained its former satisfactory condition, Singo especially having done well this year. The great drawback of many parts of the Mubendi District, and also Toro, is the difficulty of obtaining cheap transport, and this causes prices to keep rather low.

Coffee cultivation by natives has been much neglected of late, both in the Toro and Mubendi Districts, owing to the difficulty in obtaining a sale for the crop.

J. D. SNOWDEN,
District Agricultural Officer.

ANNUAL REPORT

ON THE

BOTANIC GARDENS, ENTEBBE.

The arrival of an Assistant District Agricultural Officer in June relieved the writer of many of the duties attaching to the Plantation at Kampala, and thus enabled him to give closer supervision to the Gardens than had previously been possible.

Weather.

The conditions prevailing throughout the period covered by this report were of a very trying nature. A long drought existed, which broke during February of the present year. Indeed the only reliable planting weather experienced during the two years 1917-1919, the period during which the Gardens have been under the control of this Department, was February and March this year, and two short periods during April and May of 1918. The meteorological data, giving fuller details of the weather, are appended under Meteorology.

Nursery.

A considerable number of both economic and decorative plants have been raised for distribution, particular attention being given to fruit trees. The following are the records of the distribution of plants and seeds for the year:—

PLANTS.		SEEDS.		
<i>Economic.</i>	<i>Decorative.</i>	<i>Packets.</i>	<i>Single.</i>	<i>Para.</i>
2,000	700	390	360	85,000

The distribution of seeds includes those sent to botanic stations in the colonies and other parts, and those distributed to District Commissioners throughout the Protectorate—the latter including for the greater part seeds of economic trees and plants.

Seed List.

A seed list has been in the course of compilation with a view to exchange purposes with other botanic stations, the list containing the names of the exotic and indigenous plants in the Gardens. There are, however, a number of outstanding decorative and economic plants indigenous to these parts which are not represented at present here, and which it was hoped would have been obtained and included in the list, but this was not possible during the year and the list was therefore held over.

Introduction of Plants.

Several botanic stations in various parts of the world were communicated with, requesting seeds and plants of botanic and economic interest. In each case a ready response was met with, resulting in a very useful variety of seeds being received, from which a good many plants were raised. The following list includes plants from the seed referred to above, together with a few raised from plants already in the Gardens:—

Planted 1918-19.

ECONOMIC.	DECORATIVE.
Albizzia stipulata	Areca concinna
Artocarpus sp.	Acacia spadicigera
Anacardium occidentale	do Farnesiana
Calodendron Capense	Clerodendron Bakeri
Caesalpinia Sepiaria	do Capitatum
do Sappan	do poiniculatum
do boudecella	do Guerkii
Callistemon leucodendron	do Thomsoni
Crescentia cujete	Cassia didymobotrya
Carrisa Wyliei	do glauca
Castanospermum cunninghami	do corymbosa
Casuarina equisetifolia	do bicapsularis
Diospyros discolor	do Montana
Eucalyptus Amygdalina	Caesalpinia Gilliesii
do Molleriana	Celtis rhamnifolia
Gliricidia maculata	Bixa sp.
Haematoxylon campechianum	Brownea concinna
Juniperus Californica	Bignonia unguis-cati
Pinus Merkusii	Beaumontia grandiflora
do Malepensis	Brunfelsia americana
Phyllanthus distichus	do uniflora
Pachyrhizus tuberosus	Dombeya calantha
	Erythrina caffra
	Excaecaria discolor
	Thunbergia arrecta, Vars.
	Jasminum sp.
	Kalanchoe Kewensis
	Mimosa asperata
	Morea iridifolia
	Melletia caffra
	Salvia splendens var. atrosanguinea
	Schizolobium excelsum

Flower Beds.

The majority of the flower beds were replanted, mostly with plants of a more or less permanent nature such as roses, *Euphorbia pulcherrima*, Cannas, *Plumbago Capensis*, *Salvia splendens*, etc.

The ground in the Gardens, being hilly, suffers very readily from drought and it is imperative to have the beds well manured with cow-dung to have anything of a "show" during the dry periods.

A series of oblong and circular beds was cut out on an oblong piece of lawn bordered on the one side by the Bauhinia Avenue and on the other by Cocoa Plot No. 2. These were in the process of being filled up with roses.

Roses.

An endeavour was made to collect as many varieties of roses as are in the country, as the Gardens contained only a few. The following were added during the year:—

Captain Christie
La Fance
Paul ?
Viscountess Tothlested
Lady Burrie
Sunrise

Perle d'Or
Madam Cochet
do do (White var.)
Pa-Pa Gontier
Celine Forrestier
Master Teynel

and several other good but unnamed varieties.

Many of these roses seed readily here, and a number of seedlings have been raised, a few of which are quite distinct in colour.

Trees in Flower and Fruit.

The following are some of the more important plants and trees which have flowered and fruited during the year:—

The *Spathodea nilotica*, *Baikiaea insignis* and *Monodora myristica* were mentioned in detail in last year's report. They are probably three of the best flowering trees we possess. The first is known locally as the "Tulip tree" or the "Flame of the Forest"—both very appropriate names. Our best tree flowered continually from the middle of July to the middle of September, 1918, after which it shed its leaves. It was refoliated and on the point of flowering again by the end of March, 1919. Its long flowering periods make the tree superior in this respect to the "Flamboyant," *Poinciana regia*. Being a native of these parts it is doubtful whether the tree would respond so well to the climatic conditions obtaining outside Central Tropical Africa, or where the rainfall is less equally distributed.

Some very fine "Calabashes" were collected from the *Monodora myristica*, *Dun*. There were 14 of them. This was all which resulted from a considerable profusion of flowers, and might be considered a poor result, but on the other hand some of these "Calabashes" contained as many as 200 to 600 seeds and the total was 5,150, all of which were perfectly sound.

Champaca (*Michelea Champaca*):—There is a small group of this tree in the lower part of the Garden, which has flowered on two separate occasions during the year. The flower is yellow, somewhat resembling a narcissus, and sweet-scented. The tree belongs to the *Magnolia* family. It is never leafless, and it therefore makes a delightful avenue, and a number of the plants have been distributed for this purpose.

The Indian Shade Tree, *Acrocarpus fraxinifolius* flowered profusely. It is a tree somewhat resembling the "Ash," *Fraxinus*. There are three trees here, and each flowered at a different period and were leafless, or almost so, at the time.

The "Muziru" *Sorindica sp.*, is an interesting tree. A native, and a member of the mango family *Anacardiaceae*. Most of our trees flowered and have produced a profusion of damson-like fruits in long panicles. These fruits are very tempting in appearance, and are much relished by birds, but are not eaten by the natives unless during times of extreme scarcity.

West African Oil Palm (*Elæis Guineensis*):—We possess three of these palms, but only one has come into bearing up to the present—the one in the group of *Cupressus macrocarpa*. There is no record as to when they were planted, but probably during 1907 or 1908 as they are presumably plants raised from seeds sent from Semliki Valley during Mr. Dawe's tour of 1906. It may be mentioned incidentally that there are quite a number of these palms distributed throughout Kiagwe, Kiadondo and Busiro in native compounds, many of which are fine specimens.

Encephalartos sp. is another plant from the Ruenzori region which we have in the Gardens, and it is a very useful decorative plant. Several fine cones were collected during the year, but the best specimen is a male one which has produced numerous large catkins. It is a member of the Cycad family, and indigenous to the slopes of Ruenzori.

The West African Cola (*Cola acuminata*), and the "Benzoin" or "Benjamin" gum, *Styrax benzoin*, the "Clove" *Eugenia caryophyllata*, the "Nase-berry" *Achras sapota*, the "Litchi" *Nephelium litchi* have all flowered, but neither the "Cola" nor the "Litchi" have fruited.

Labelling.

The relabelling of trees was put in hand during the year. Hitherto the system consisted of lead tablets 4"×5", which were hung on the trees by wire. The weight of the label invariably caused it to tear itself away from the wire, and as a result the labels were usually lying about. Stands were made with a piece of stout iron rivetted on top, and at the angle, having a groove top and bottom to receive the tablets of lead. In this way it was possible to use many of the old tablets after repainting them.

Paths and Drains.

Some parts of the paths and drains, which had got out of order, were put under repair, and some new drains were made. Shallow concave drains were put down across several steep parts of the paths, in order to break the wash. These have answered admirably. There is a large supply of iron-stone in the vicinity of the Gardens which is easily "dressed," and this has been used in making the drains.

Para Rubber Tapping.

Last year's report contained the records of yields from five series, but only for a period of a little over six months. These series are included in the table below showing their yearly yield and subsequent yields up to the end of March, 1919. The table also includes three new series, making eight in all. It possesses considerable interest as it contains yields from young as well as old trees, the old trees being some of the oldest in the country.

Although certain of the series may not be comparable with others, that is, in proving the advantages of one system over another, they possess a certain value in themselves, as for instance Series 7, which consists of two lines of trees forming an avenue, and are thus more favourably situated than those in groups and overcrowded. They show a better development than those of roughly the same age in more congested conditions, bark renewal is more satisfactory, and they give a clear demonstration of the benefits accruing from wider spacing; and also Series 8, which is mostly distributed over a stony part much affected by wash and therefore at a disadvantage.

As regards yields, it will be seen that those from the more conservative systems are very satisfactory. Series 2 (1" cut to left on $\frac{1}{3}$ surface daily) would appear to be the best, but Series 1 (1" cut to left on $\frac{1}{2}$ surface alternate days) has given a good return, for although the yield is less by 803 lbs. compared with Series 2 the amount of bark excised is roughly about half, and this is a consideration in young trees. There is a great leaning towards conservative tapping on virgin bark, and, especially where paring is thick and irregular, the latter system is a very suitable one.

In choosing a daily cut, however, the 1" cut on the $\frac{1}{3}$ surface system is certainly preferable to the $\frac{1}{2}$ surface, for the tendency here is to use up far too much bark in a given time so that a $\frac{1}{2}$ cut does not allow for four years bark renewal. The $\frac{1}{3}$ cut would to some extent obviate this. This is apart from advocating this system over the other in so far as it is less severe on the physiology of the tree.

With respect to the yields from the young trees, from the $\frac{1}{2}$ single cut there is a yield of 1·715 lbs. for the year, and for the succeeding period of 6½ months, which includes a rest period of two months, 1·101 lbs., and from the $\frac{1}{2}$ single cut 1·027 lbs. for the year and for the subsequent period, as in the above series, 986 lbs. These are, to say the least, very good when the low level of paring is considered. The single $\frac{1}{3}$ cut alternate days is probably rather conservative. From this series the yields are 851 lbs. and 476 lbs. respectively, including, as before, a rest period of two months.

The V cut on the old group Series 3 was continued, as the bark is not very convenient at present for changing over to a single cut from the left. This cut, as was mentioned in last year's report, was the basal of the "herring-bone" system which was being practised on the trees previously. This series has been pared on four years renewed bark, and the yield for the year was 5·275 lbs. and 2·876 lbs. for the subsequent period of 6½ months, with a rest period of two months. The two cuts on the $\frac{1}{3}$ surface in Series 5 has proved far too extravagant, and the system has been reduced to 1" cut. The yield for the latter period is from the single cut.

In the new series two cuts on the $\frac{1}{4}$ surface was adopted (Series 4 and 8), as this is a fairly popular system on old trees, but superposed cuts have proved a disadvantage and yields are not commensurate with the amount of bark excised, and, in view of the fact that superposed cuts tap the same series of laticiferous vessels, it is proposed to divide Series 6 into two series—one of 50 trees with one $\frac{1}{4}$ cut, and one of 50 trees with two $\frac{1}{4}$ cuts. This will allow for comparative yields. With regard to Series 6, the table shows a remarkably good yield. The highest yield for one month was 75 lbs. sheet rubber during August, but the yields decreased towards the end of the year and during the drought.

Tapping was carried out on five years renewed bark in Series 7. The table shows 5·288 lbs. per tree for a period of 8½ months. Some of these trees have a very considerable basal girth, the cut being in some cases as much as 33", 36" and 40" long, and these facts together with their favourable conditions account for the high yields.

From these records it is obvious that, starting with young trees, a very satisfactory progressive yield can be relied on.

The Paring:—The paring is still unfortunately at a low level, and it would seem almost impossible to effect much of an improvement. The tappers are as a rule very unreliable, as they take leave of absence and return at their leisure, and generally show a lack of interest. The result has been that several tappers were on the same series during the year, some of them only learners. This is regrettable as there is an unnecessary wastage of bark all round, which effects not only yields but retards bark renewal.

Progressive and Comparative Records.

1917-1918.

1918-1919.

No. of Series.	No. of Trees in Series.	Date Planted.	System of Tapping.	Weight of Sheet Rubber.	Average Yield per Tree.	Weight of Scrap.	Total Yield of Rubber.	Total Average Yield per Tree.	No. of times Tapped.	Area of Bark Excised.	Average No. of Partings.	Weight of Sheet Rubber.	Average Yield of Sheet Rubber.	Weight of Scrap.	Total Yield of Rubber.	Total Average Yield per Tree.	Periods of Rest.	Average (thirh.	REMARKS.
1	100	Sept., 1911.	1 cut to left on $\frac{1}{2}$ surface. Alternate days.	89 15	899	14 12	102 11	1027	252	15"	17	83 0	830	15 11	98 11	986	Dec. & Jan.	24"	This record is over the period from 10th Sept., 1918 ($6\frac{1}{2}$ months), to 31st March, 1919, including a rest of 2 months.—Actual yielding period $4\frac{3}{4}$ months.
2	100	Sept., 1911.	1 cut to left on $\frac{1}{2}$ surface. Daily.	144 11	1447	26 13	171 8	1715	492	27"	18	95 2	951	15 0	110	21101	Dec. & Jan.	24"	do
3	50	Dec., 1904.	V cut $\frac{1}{2}$ surface. Daily.	240 12	48	23 0	263 2	5275	493	29"	17	121 0	242	23 14	144	142876	Dec. & Jan.	42"	do
4	100	Sept., 1911.	1 cut to left on $\frac{1}{2}$ surface. Alternate days.	47 11	477	11 7	59 2	851	232	15"	16	34 7	344	13 3	17 10	476	Dec. & Jan.	24"	This record is over the period from 1st Oct., 1918, to 31st March, 1919, including 2 months rest (6 months). Yielding period 4 months.
5	100	1908.	2 cuts, $\frac{1}{2}$ surface. Daily. Changed to 1 cut.	398 03	398	47 0	455 0	445	379	20"	18	66 8	665	8 14	75 6	753	Dec. & Jan.	35"	This record is over the period from 30th Nov., 1918, to 31st March, 1919, including 2 months rest (4 months). Yielding period 2 months.
6	100	Oct., 1905.	2 cuts to left on $\frac{1}{4}$ surface. Daily.	—	—	—	—	—	188	13"	15	408 0	408	55 12	463	124637	26th Dec. Jan.	40"	This record is over the period from 27th June, 1918, to 31st March, 1919, including 1 month's rest (9 months). Yielding period 8 months.
7	42	1906.	1 cut to left on $\frac{1}{2}$ surface. Alternate days.	—	—	—	—	—	111	8"	14	178 8	425	13 10	222	25288	—	37"	This record is over the period from 15th July, 1918, to 31st March, 1919. ($8\frac{1}{2}$ months).
8	90	Oct., 1905.	2 cuts to 1-ft on $\frac{1}{4}$ surface. Daily.	—	—	—	—	—	197	14"	14	321 13	3575	61 7	383	44257	—	34"	This record is over the period from 15th May, 1918, to 31st March, 1919. ($5\frac{1}{2}$ months).

Cacao.

The yields of pods were again recorded for the year, and these are given in the tables below, in conjunction with those of the previous year for comparison.

In some cases the averages show a decrease, but in the total number of pods collected there is an increase of 301 and 55 respectively from the two sets of trees. There is a decided improvement, as a whole, in the trees. They have had more care perhaps during the year than is usual, for the plot has been all thoroughly dug over several times. Each tree was manured with cow-dung, and they were pruned and relieved of their superfluous wood. However, much of the benefit arising from the treatment has been largely counteracted—that is, as far as the yields of pods is concerned—by “scale” (*Stictococcus diversiseta*, Silv.), and “Mosquito Blight,” as numerous pods have been destroyed by these pests. The former is a very persistent one; indeed both are for that matter. In the absence of a whale or fish-oil spray for the “scale” a resinous one was tried, consisting of resin, soft-soap and Jeyes, and there is certainly an improvement since it was adopted.

Cacao Yields.

Plot No. 1. Planted 1901.

CALABACILLO.								FORASTERO.								
RED.				YELLOW.				RED.				YELLOW.				
Number of Pods.				Number of Pods.				Number of Pods.				Number of Pods.				
No. of Tree.	Previous Record.	Present Record.	Total to date. (2 years)	No. of Tree.	Previous Record.	Present Record.	Total to date. (2 years)	No. of Tree.	Previous Record.	Present Record.	Total to date. (2 years)	No. of Tree.	Previous Record.	Present Record.	Total to date. (2 years)	
8	54	21	75	4	266	215	481	1	68	67	135	2	129	225	354	
9	124	75	199	7	262	369	631	3	104	69	173	11	2	7	9	
12	7	36	43	10	57	42	99	17	16	108	124	16	68	56	124	
13	75	66	141	14	85	144	229	20	142	184	326	19	54	21	95	
28	5	1	6	22	312	172	484	21	114	133	247	27	18	91	109	
30	56	233	289	24	121	54	175	23	42	92	134	60	8	29	37	
32	54	77	131	29	3	10	13	18	206	128	334	90	0	19	19	
33	26	32	58	31	32	87	110	36	54	30	84					
39	22	31	53	35	65	43	108	44	4	16	20					
40	27	26	53	37	25	44	69	79	41	24	65					
42	72	208	280	64	23	20	53									
74	1	3	4	85	65	255	310									
76	19	24	43													
80	57	118	175													
82	82	136	218													
87	9	16	25													
TOTALS	16	690	1,103	1,793	12	1,316	955	2,771	10	791	851	1,642	7	279	468	747
Averages per tree 1917-18	43.2				109.7				79.1				39.8			
1918-19		69				79.5				85.1				67		

Plot No. 2. Later Plantings.

CALABACILLO.								FORASTERO.								
RED.				YELLOW.				RED.				YELLOW.				
Number of Pods.				Number of Pods.				Number of Pods.				Number of Pods.				
No. of Tree.	Previous Record.	Present Record.	Total to date. (2 years)	No. of Tree.	Previous Record.	Present Record.	Total to date. (2 years)	No. of Tree.	Previous Record.	Present Record.	Total to date. (2 years)	No. of Tree.	Previous Record.	Present Record.	Total to date. (2 years)	
49	31	10	41	43	110	33	143	41	58	18	76	34	44	35	79	
52	34	157	191	48	21	23	44	50	75	120	195	46	82	65	147	
55	10	77	87	51	6	65	61	53	149	52	201	47	50	26	76	
63	11	26	37	56	57	17	74	66	14	15	29	57	26	17	43	
65	23	69	92	67	96	68	164	72	64	132	196	58	33	31	64	
69	15	16	31	68	54	55	109	73	35	32	67	61	41	12	53	
70	26	11	37													
71	10	29	39													
84	37	64	101													
TOTALS	9	197	459	656	6	344	251	595	6	395	369	764	6	276	186	462
Averages per tree 1917-18	21.9				57.3				66				46			
1918-19		51				42				61.5				31		

Meteorology.

The meteorological records for the year, of all the stations, have been duly compiled, and they are attached herewith (*see* Appendix No. 13).

The rainfall records of the Protectorate probably evoke more general interest than any other of the returns. The appendices shew records from 52 localities.

The mean rainfall for Entebbe for the last six years, exclusive of 1918, is 62·08"—that recorded for 1918 was only 48·98." For Kampala the mean is 49·92," and the rainfall for 1918 only 32·37," and for Jinja 49·55" and 28·59" respectively. Such a disparity is, as we have experienced, very serious.

In conclusion :—The meteorological work is undoubtedly of great importance, but owing to lack of staff it has not been possible to devote to it the time and supervision it demands. The out-stations ought to have been visited and the instruments tested. There have been some breaks in the records in the out-stations, in some cases unavoidable, in other cases largely preventable had time been available to visit the stations.

The records of the out-stations are mostly kept by the District Commissioner's or the Medical Officer's clerk, who has had to do the recording in his own time. It is hoped that provision will be made in the next Estimates for an "honorarium" for these recorders as an inducement to more careful recording. Then again, the Observatory in the Botanic Gardens, which is our principal one, is much too crowded, and the enclosure itself is too sheltered by buildings and trees, and, although money was available for the erection of a new enclosure in a well exposed place, the Public Works Department, owing to shortage of labour, was unable to undertake the work and the matter has been held over for the next Financial Year.

T. D. MAITLAND,
Curator.

ANNUAL REPORT OF THE CHIEF VETERINARY OFFICER.

Diseases of Cattle.

Rinderpest.

BUGANDA PROVINCE.

Early in April the epidemic of rinderpest, which had been spreading southwards through the game in Bunyoro since the previous July, crossed the Kafu and appeared amongst the game in Buruli and Singo. Buffalo, bush-pig, bush-buck, cobus cob, reed-buck and oribi died in considerable numbers near the Kafu. Buffalo from the infected area at Kijaguso in Singo migrated westwards towards Bugangadzi and southwards along the Myanja Valley. Mr. Poulton found carcasses of buffalo which had died from rinderpest near the Hoima road some thirty-five miles south of the then nearest known infected area. It was not until the end of May that the epidemic spread to the cattle, when herds in Kitesa were found to be infected.

In July rinderpest spread eastwards from Singo to the cattle in Bulemezi and in August into Kiadondo, Busiro and Kiagwe. During May carcasses of buffalo were found throughout most parts of Northern Singo, and in June rinderpest was reported first in buffalo and then in cattle in Bugangadzi. From Buimbadzi in north-western

Singo rinderpest spread southwards in September through the buffalo along the Kitumbi river and then to the buffalo on the Nabukazi in Bwekula and Singo. In Bwekula buffalo, bush-buck and bush-pig died in large numbers; the eland also suffered. Up to September the epidemic was confined to the north of the watershed between the Kafu and the Katonga rivers and only appears to have spread to the south of this line through the buffalo along the Kitumbi and Nabukazi rivers.

From Bwekula rinderpest spread to Gomba in December and thence across the Katonga into Buddu, Mawagolo and Kabula in January. From Bwekula the epidemic was also spread in January by the buffalo to Toro.

In Singo, Bwekula and Bugangadzi the spread of the infection appears to have been mainly due to the movement of game from infected to clean areas; in most cases the carcasses of the game were found before the cattle in these areas became infected.

In the Masaka district the first outbreaks were not reported for some weeks after the disease had been introduced, with the result that the epidemic made rapid progress and caused very heavy losses amongst the herds in this district.

It is estimated that approximately 30,000 cattle died from rinderpest in the Buganda Province during the year.

INOCULATIONS.—13,193 cattle were inoculated by the simultaneous method of virulent blood and serum in the Mubendi district, 7,303 in the Mengo district, 397 in the Entebbe district and 976 in the Masaka district. Considerable difficulties were experienced in obtaining reliable virulent blood, and it was necessary to reinoculate a number of herds which had not reacted. Extremely heavy losses from trypanosomiasis occurred amongst the cattle inoculated at Kasanda in Singo; a large number of the herds inoculated at this centre were subsequently found to be infected with *T. Pecorum* and the majority of these died from this disease. The mortality in most of the inoculation camps was high and in some averaged about twenty per cent from all causes, the largest proportion of deaths being amongst calves or very old animals, amongst herds infected with rinderpest prior to inoculation and herds infected with trypanosomiasis.

EASTERN PROVINCE.

In Busoga numerous outbreaks of rinderpest were reported during the year but there was no staff available to deal with these.

In Lango outbreaks of rinderpest occurred at Kabiramaido, Lwala and Kelle.

In Teso there were outbreaks in the counties of Bukidea, Kumi, Usuku and Soroti. Heavy losses were reported round Orungo.

In Bukedi numerous outbreaks were reported in the Bugishu counties and in Budama.

INOCULATIONS.—2,370 cattle were inoculated in the Lango district, 1,137 in the Teso district and 360 in the Busoga district.

WESTERN PROVINCE.

In January rinderpest was introduced by buffalo from Bwekula into the south-eastern part of the Toro district, large numbers of buffalo were reported to have been found dead in areas in which they had not previously been known. As the quarantine regulations were well kept the disease has not as yet spread to the cattle outside the original centres of infection.

In January rinderpest was reported in the counties of N'sara and Nyabushozi in Ankole near the Masaka border and very heavy losses resulted. Owing to the shortage of serum, and as there was no Veterinary Officer available for Ankole until the end of March, no inoculations were carried out.

TRYPANOSOMIASIS.

Outbreaks occurred amongst herds in south-western Singo, in Bugerere and at Butiaba. Cattle at Kigamere in Buyaga were found to be infected. *Glossina Fusca* were found in this neighbourhood on the Djumambogo river. Herds at Kyabanja, Kiguale and Kagoro in Toro were also found to be infected.

Foot and Mouth Disease.

Several outbreaks were reported in Buganda but this disease was not so prevalent as it has been in recent years.

Tuberculosis.

A case of pulmonary tuberculosis in an Ankole cow was found at the Kampala slaughter house. Several cases have been found in Ankole cattle sent to Kabete.

Anthrax.

An outbreak was reported at Mbarara by the District Medical Officer. The disease appears to be well known in most parts of the Western Province.

Diseases of Equines.

Two cases of ulcerative lymphangitis were treated.

Diseases of Sheep and Goats.

Outbreaks of scab were not so numerous as in previous years.

Diseases of Fowls.

Two cases of Avian tuberculosis were found in Kampala on post mortem examination. These fowls had been imported from British East Africa.

Exportation of Cattle.

1,035 cattle were exported from the Buganda Province to British East Africa, these included 350 head for the production of rinderpest serum at Kabete.

Registration of Brands.

13 brands were registered during the year.

Kampala Slaughter House Returns

FROM 1ST APRIL, 1918, TO 31ST MARCH, 1919.

MONTHS.	ANIMALS EXAMINED.							CONDEMNATIONS.	
	CATTLE.		SHEEP.		GOATS.			Carcases.	Parts.
	Male	Female	Male	Female	Male	Female	Wether		
April	4	34	14	3	75	14	8	7	33
May	7	50	15	6	95	22	—	15	35
June	1	56	1	—	1	3	3	2	52
July	2	60	27	4	59	9	—	4	47
August	4	52	35	5	77	15	9	1	41
September	6	48	16	10	42	13	1	2	37
October	10	51	24	9	45	26	3	4	34
November	10	30	16	13	62	37	8	3	22
December	11	42	10	15	27	19	2	3	30
January	7	66	2	—	27	8	6	1	40
February	9	61	9	2	61	21	11	9	22
March	2	22	5	—	10	3	6	2	10
TOTAL	73	572	174	67	581	190	57	53	403

Summary of Slides Examined, Kampala.

CATTLE.		MISCELLANEOUS.	
Trypanosomes	... 430	Fowls, Tuberculosis	... 12
Tubercle	 2	„ Aspergillus	... 3
Anaplasma	 15	„ Negative	 7
Negative	 8,979	Bush-Buck, Negative..	1
East Coast Fever	 2	Goats, Trypanosomes..	22
Dogs.		„ Negative	 139
Trypanosomes	 18	Sheep, Negative	 5
Piroplasma	 43	Buffalo, Negative	 1
Negative	 115		

Cases Treated at the Veterinary Dispensary.

Cattle		255	Dogs		136
Goats		8	Donkeys		4
Fowls		8	Duck		1
Turkey		1			

Deaths of Government Live Stock.

Deaths reported amongst Government live stock in various districts are shewn in the following schedule:—

Schedule shewing Deaths reported amongst Government Live Stock during 1918-1919.

NAME OF PLACES AND DISTRICTS.	Bullocks.	Calves.	Donkey.	Lymphangitis.	Anaplasmosis.	Trypanosomiasis.	Rinderpest.	Slaughtered.	Old Age.	Accidents.	Cause of death not known.
SOROTI	2	...	1	1	...	...	...	...	...	...	2
MATIRI—TORO	7	...	...	...	...	...	...	...	...	...	7
MATIRI	32	...	...	...	...	...	...	...	...	1	21
KAMPALA	40	1	...	...	1	38	...	...	1	...	1
ENTEBBE	12	...	...	...	...	1	...	2	6	1	2
MUBENDI	1	...	...	...	...	...	...	...	...	1	...
BUKOMERO	5	...	...	...	...	...	5	...	...	...	...
TERO FOREST...	1	...	...	...	...	...	...	...	...	...	1
BUSOGA	5	...	...	...	...	...	...	...	...	...	5
MBALE	1	...	...	...	...	...	...	...	...	...	1
CHUA	1	1	...	...	...	...	...	...	...	1	1
TOTAL	97	2	1	1	1	39	5	2	7	4	41

In conclusion I again wish to thank all the members of the Veterinary Staff for their good work carried out under great difficulties throughout the year.

E. HUTCHINS,
Chief Veterinary Officer.

REPORT OF THE GOVERNMENT ENTOMOLOGIST FOR 1918-1919.

From June 18th to August 26th, 1918, I was on leave in British East Africa.

2. During the ten months while I was on duty I visited fifteen estates, and I was also absent from headquarters on a week's visit to the Kome and Sese Islands.

3. The insect pests of the year are listed under the crops on which they occur, and short accounts are given of those pests that have not been dealt with in previous Annual Reports.

Pests of Coffee.

The pests which attacked this crop during the year under review are—

1. Fruit Fly—*Ceratitis capitata*, Wied.
2. Berry Borer—*Stephanoderes coffeae*, Haged.
3. Stem Borer—*Apate monacha*, Fab.
4. „ „ —*Anthores leuconotus*, Pasc.

5. Leaf Eating Caterpillar—*Metadrepna glauca*, Hmp.
6. Leaf Miner—*Leucoptera (Cemiosstoma) coffeella*, Staint.
7. Cutworms—*Agrotis* sp.
8. Thrips—*Diarthrothrips coffeae*, Will.
9. Variegated Bug—*Antestia orbitalis*, var. *faceta*, Germ.
10. Plant Bug—*Lycidocorus mimeticus*, R. & P.
11. " " —*Piezodorus pallescens*, Germ.
12. "Green Fly"—*Toxoptera coffeae*, (Nietn).
13. Scale Insects—*Icerya nigroareolata*, Newst.
14. " " —*Asterolecanium coffeae*, Newst.
15. " " —*Pseudococcus citri*, (Risso).
16. " " —*Pulvinaria psidii*, Mask.
17. " " —*Ceroplastes ceriferus*, And.
18. " " —*Ceroplastes destructor*, Sign.
19. " " —*Ceroplastes galeatus*, Newst.
20. " " —*Ceroplastes vinsonioides* Newst.
21. " " —*Coccus africanus*, Newst.
22. " " —*Coccus viridis*, Green.
23. " " —*Saissetia hemisphaerica*, (Targ).
24. " " —*Saissetia nigra*, (Nietn).
25. " " —*Saissetia subhemisphaerica*, Newst.
26. " " —*Stictococcus gowdeyi*, Newst.
27. " " —*Selenaspis articulatus*, (Morg.).
28. " " —*Ichnaspis longirostris*, (Sign.)

The White Coffee Stem Borer, *Anthores leuconotus*, Pasc., was reported on one estate. According to Morstatt, this beetle was very destructive in "German" East Africa, and I have collected many adults in that country. It was discovered in Uganda in 1900,* but it has not hitherto come under my notice as causing damage to coffee. To my mind the control of this borer presents no more difficulty than the control of the Yellow-Headed Coffee Borer.

The Thrips, *Diarthrothrips coffeae*, Will., was reported from Masaka and Masindi districts. In the latter it caused considerable loss within a short period. A paper dealing exhaustively with this family of insects was read at the Uganda Planters' Association Annual Conference.

The Variegated Bug, *Antestia orbitalis*, Westw., var. *faceta*, Germ., does not appear to have been prevalent in such large numbers or to have caused so great loss as in the preceding year. This is particularly evident on a certain estate on which the rearing of the egg parasites was systematically carried out when the bugs were present in an extraordinary large number, the result being that the bugs are very few indeed.

The Scale Insect, *Asterolecanium coffeae*, Newst., was reported from Mubendi and Toro districts. On one estate in the latter district this insect appeared in large numbers and on some trees it was associated with the scale insect, *Saissetia hemisphaerica*, (Targ), which is always accompanied by the sooty mould, *Capnodium brasiliense*, Putt. On this estate steps were adopted to destroy the larvæ of the lady-beetle, *Chilocorus discoides*, Crotch., the planter being ignorant of the fact that "the lady-beetle" larvæ were feeding on the scale insects and were therefore beneficial.

Pests of Cacao.

The pests, on which advice was sought or which I personally observed, were—

1. "Mosquito Blight"—*Helopeltis bergrothii*, Reut., var.
2. Pentatomid Bug—*Libyaspis (Plataspis) vermicellaris*, Stal.
3. Plant Louse—*Toxoptera theobromae*, Schout.
4. Scale Insect—*Pseudococcus citri*, Risso.
5. " " —*Inglisia castilloae*, var. *theobromae*, Newst.
6. " " —*Stictococcus diversiseta*, Silv.
7. Shot-hole Borer—*Xyleborus camerinus*, Haged.
8. Twig Girdler—*Sthenias cylindrator*, Fab.
9. Leaf Eating Beetle—*Adoretus hirtellus*, Castn.

10. Fruit Fly—*Ceratitis punctata*, Weid.
11. Thrips—two unidentified species.
12. Leaf Eating Caterpillar—*Parasa vivida*, Walk.
13. " " " "—*Diacrisia maculosa*, Cram.
14. Pod Moth—*Nygmia* sp.
15. " " "—? *Phthoropora Carpella*, Wlsm.

With the exception of the last mentioned insect, accounts have been given of all these insects in previous Annual Reports to which I can add nothing.

The Pod Moth, *Nygmia* sp., was wrongly referred to as *Euproctis mediosquamosa*, B.—Baker, in my last Annual Report.

The other Pod Moth, *Phthoropora carpella*, Wlsm., has not previously been recorded as a pest on this crop in Uganda. I regard it as a secondary pest in that it seemingly attacks only cacao pods which are previously attacked by pod rot.

The Scale Insect, *Stictococcus diversiseta*, Silv., has been discovered to be parasitised by the Chalcidid wasp *Aethognathus afer*, var. *cavilabris*, Waters, (var. nov.).* The parasitised scale insects were collected in the Botanic Gardens, Entebbe.

Pests of Cotton.

The pests reported or observed on this crop during the year were—

1. Cotton Stainer—*Dysdercus nigrofasciatus*, Stal.
2. " " "—*Dysdercus pretiosus*, Dist.
3. " " "—*Oxycaraenus gossipinus*, Dist.
4. " " "—*Oxycaraenus hyalipennis*, Costa.
5. Bollworm —*Earias insulana*, Boisd.
6. " Green Fly " —*Aphis gossypii*, Glover.
7. " " "—*Chlorita facialis*, Jac.

Chlorita facialis, Jac., has not been previously recorded on this crop in this country. This pest is a small greenish-white insect, which feeds on the underside of the leaves and within the bracts.

Pests of Rubber.

On Para rubber information was sought on the following insects—

1. Bourbon Scale Insect—*Aspidiotus destructor*, Sign.
2. Shot-Hole Borer —*Xyleborus affinis*, Eich.
3. " " " "—*Xyleborus confusus*, Eich.
4. " " " "—*Xyleborus perforans*, Woll.

and on Ceara rubber—

1. *Aspidiotus destructor*, Sign.

The Bourbon scale insect is preyed on by the "lady-beetle," *Chilocorus discoideus*, Crotch.

Pests of Miscellaneous Crops.

Sugar Cane.

Two species of scale insects were found on sugar cane at the Government Plantation, Kampala—*Pseudococcus* sp. (?) and *Chionaspis madiunensis*, Zehnt. The latter is new to our fauna and I can only find records of this scale insect occurring in Java, whence it most probably has been imported.

Bananas.

1. Bourbon Scale Insect.

Aspidiotus destructor, Sign.

This insect is found throughout the country on bananas, but shows a preference for the red variety.

* Bul. Ent. Res., VII., p. 313, 1917.

2. Banana Borer.

Cosmopolites sordida, Chevr.

This beetle has lately made its presence felt as a pest on bananas. That it is not an alien insect, or at least of recent introduction, to my mind, is borne out by the fact that, as well as occurring on the mainland, it has been collected on Bukassa Island, Sese Group, for years uninhabited.

Up to the present in every case in which this beetle has been found in banana plots, the plots are old, worn out—in some cases as much as twenty-five years old,—surface of the soil hard, no mulch of banana stems; in fact but little cultivation of any sort.

The effect of the beetle on the plants is to stunt them, the leaves do not unfold, the fruit buds do not unsheath and become distorted—all these effects being due to the fact that the point of infestation is at the most vital point, namely, the crown or corm.

The eggs, which are oval in shape and creamy-coloured, are deposited singly in punctures in the crown. The number of eggs appears to be in the neighbourhood of thirty.

The larva is footless, cream-coloured, with the head brownish in colour and the first thoracic segment yellowish; first two abdominal segments are constricted; length of fully grown larva is 20mm. On hatching from the egg the larva bores tunnels in the corm, seldom penetrating into the trunk unless the infestation is considerable. The tunnels end near the outer side of the corm in a chamber in which the larva pupates, forming no cocoon, but surrounds itself with a certain amount of frass. The larval period is about three weeks.

The pupa is white in colour. The pupal stage lasts from eight to ten days.

The adult insect is a black weevil about $\frac{1}{2}$ inch in length, and provided with a strong beak; the wing-covers, which almost entirely conceal the abdomen, are longitudinally grooved. The adults are long lived; in the laboratory they have been kept alive for six months. In plantations they are found in the soil and under the fibre near the roots. They apparently breed throughout the year and as bananas are grown for several years on the same plot all the plants in an infected plot soon become affected.

Other than resorting to the rearing of its predators (certain Historids), by reason of its habits the only means whereby this pest can be kept under control are by the destruction of all infested plants and good cultivation and sanitary measures.

Household Pests.

1. Bed Bug—*Cimex lectularius*.

Two European houses and three servants' quarters were fumigated on account of this insect.

2. Cockroaches.

One European house and one servant's quarters were fumigated on account of the two species of cockroaches, *Phyllodromia germanica*, L., and *P. mirabilis*, Shelf.

In every case the fumigant used was Hydrocynic Acid Gas.

3. Case-bearing Clothes Moth.

Tinea pellionella.

I was consulted with regard to the treatment of this insect which was destroying the felt on the piano keys. I have no previous record of this insect in this country.

Locusts.

Three swarms of the locust, *Gyrtsanthacris septemfasciata*, Serv., var. *fascifera*, Wlk., were reported during the year; on mile 86—87 on the Kampala—Mubendi road travelling in the direction of Singo district; on the Mubendi—Tpro road travelling in the direction of Lake Albert; in Masindi district travelling north-eastwards and south-eastwards.

Plant Imports.

Ninety-five consignments of plants and seeds were inspected during the year from the following countries:—

United Kingdom	...	...	...	10
France	...	...	...	8
India	...	...	...	2
Ceylon	..	...	...	3
Egypt	...	...	...	3
"German" East Africa	...	...	...	20
British East Africa	...	...	...	31
South Africa	...	...	...	17
Mauritius	...	..	...	1
				95

The Collection.

A large number of insects, of which several species were new, was added to the collection and, as in the preceding year, a large series of slides was prepared of scale insects, Aphids, Thrips, and Ticks.

I am greatly indebted to Dr. Guy A. K. Marshall, Director of the Imperial Bureau of Entomology, for the identification of a large number of Arthropods, of which the following were submitted:—

Ixodidae	...	...	...	9
Odonata	...	...	...	2
Orthoptera	...	...	..	45
Euplexoptera	...	...	...	2
Chrysepinae	...	...	...	1
Isoptera, spp.	...	...	...	3
Coleoptera	...	...	...	186
Diptera	...	...	...	152
Thysanoptera, spp.	...	...	...	5
Anoplura	...	...	...	8
Mallophaga	...	...	...	6
Lepidoptera	...	...	...	1
Hymenoptera	...	...	...	515
Aphididae spp.	...	...	...	7
Coccidae spp.	...	...	...	19
Rhynchota, Other	...	...	...	110
				1,071

Also I am indebted for the identification of *Thysanoptera* (Thrips) to Dr. J. Douglas Hood, of the United States Biological Survey, to whom 88 species have been submitted; to Prof. C. G. Lloyd, Cincinnati, for the identification of fungi (*Cordyceps* spp.) attacking the ant, *Paltothyreus tarsatus*, and of the fungus, *Sclerotia nigripes*, from a termitarium; to Dr. W. M. Wheeler, of Harvard University, for the identification of two species of ants; to Dr. E. P. Felt, New York State Museum, for the identification of a *Sciara* taken from the diseased bulb of lily; to Mr. A. B. Gahan, United States Bureau of Entomology, for the identification of four new species of parasitic Hymenoptera.

C. C. GOWDEY,
Government Entomologist.

APPENDICES.

Appendix 1.

Estimated Number of Live-Stock in the Protectorate.

Province and District.				Cattle	Sheep	Goats	Horses	Mules	Donkeys
BUGANDA :—									
	Mengo	...	...	35,000	7,500	70,000	...	6	6
	Entebbe	...	...	4,000	3,600	15,000	...	2	5
	Masaka	...	...	50,000	3,000	12,000	...	...	8
	Mubendi	...	...	16,000	6,000	30,000	...	1	..
	TOTAL	...	...	105,000	20,100	127,000	...	9	19
EASTERN :—									
	Busoga	...	...	30,000	18,000	45,000	...	3	10
	Bukedi	..	...	50,000	*	*	...	3	50
	Teso	...	...	157,500	42,000	92,000	...	2	40
	Lango	...	...	15,000	64,000	141,000	...	4	21
	Karamoja	}	...	No basis for an estimate.					
	Lobor		...						
	TOTAL	...	...	252,500	124,000	278,000	...	12	121
NORTHERN :—									
	Masindi	...	...	1,000	1,860	10,350	...	...	...
	Hoima	...	...	3,700	1,740	8,750	..	...	...
	Gulu	...	...	*	*	*	...	...	12
	Kitgum	...	...	9,000	7,000	30,000	...	6	150
	West Nile	...	...	31,500	22,000	50,000	...	3	3
	TOTAL	...	...	45,200	32,600	99,100	...	9	165
WESTERN :—									
	Toro	...	...	42,500	11,500	31,000	..	3	11
	Mbarara	...	...	100,000	50,000	250,000	...	...	5
	Kigezi	...	...	30,000	50,000	20,000	...	...	1
	TOTAL	...	...	172,500	111,500	301,000	...	3	17
RUDOLF :—									
	Turkwel	...	}	No basis for an estimate.					
	Turkana	...							
	Dabossa	...							
	GRAND TOTAL	...	...	575,200	288,200	805,100	...	33	322

* Number unknown.

Native Agriculture.

Province and District.	Potatoes.		Millets.		Rubbers.		Cotton.	Coffee.	Plantains.	Maize.	Dhal.	Beans.	Siam-Sim.	Sugar Cane.	Ground- nuts.	Cassava.	Tobacco.	Wheat.	Rice.	Onillies.	Cacao.	Peas.	Pine Apples.	
	Sweet.	English.	Matama.	Wimbi.	Para.	Other.																		
							ACRES.																	
BUGANDA :— Mengo Entebbe Masaka Mubendi	125,000	100	500	750	500	350	22,000	3,500	380,000	4,500	*	5,000	4,000	500	2,000	2,000	100	10	200	100	50	*	*	
	5,751	71	427	38	250	200	5,500	1,013	72,236	1,323	*	1,404	641	418	639	3,201	56	..	9	25	5	94	*	
	5,800	50	1,500	500	100	..	5,695	3,500	50,000	2,500	*	300	1,500	500	200	70	500	..	..	10	2	1,500	1,000	
	17,500	20	500	8,000	..	20	3,500	300	12,000	500	*	1,000	1,000	50	150	1,000	500	100	10	20	..	100	*	
TOTAL ..	154,051	241	2,927	9,288	850	570	36,695	8,313	514,236	8,823	..	7,704	7,141	1,408	2,989	6,271	1,156	110	219	155	57	1,694	1,000	
EASTERN :— Busoga Bukedi Teso Lango Karamoja Lobor	*	*	*	*	*	*	28,000	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
	*	*	*	*	*	10	15,000	130	*	3,000	*	25,000	3,000	*	10,000	3,000	..	..	530	*	*	*	*	
	30,000	..	25,000	50,000	..	..	48,000	50	800	*	..	*	*	*	*	3,000	..	..	150	..	..	..	..	
	..	..	..	..	..	..	13,000	*	*	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
										NO BASIS FOR AN ESTIMATE.														
TOTAL ..	30,000	..	25,000	50,000	..	10	104,000	180	800	3,000	..	25,000	3,000	..	10,000	3,000	..	..	680	..	..	..	..	
NORTHERN :— Masindi Hoima Gulu Kitgum West Nile	9,984	5	988	3,931	25	49	503	56	5,169	1,310	*	2,300	2,460	49	48	160	349	5	9	3	*	*	*	
	4,000	5	5,000	..	..	..	350	300	1,750	450	850	1,200	500	10	30	65	15	..	..	10	..	..	15	
	..	2	..	..	..	2	780	5	..	..	..	..	..	..	*	*	..	2	30	..	..	*		
	2,000	..	50,000	40,000	..	..	20	..	..	300	..	2,000	7,000	..	1,000	..	..	..	200	..	..	..	..	
	3,500	..	29,000	40,000	..	..	..	..	10	200	..	4,500	15,000	..	800	150	20	..	..	80	..	..	12,000	
TOTAL ..	19,484	12	84,988	83,931	25	51	1,653	361	6,929	2,260	850	10,000	24,960	59	1,878	375	384	7	319	13	..	12,015	..	
WESTERN :— Toro Mbarara Kigezi	10,000	5	1,000	30,000	..	..	500	75	12,000	1,000	2,000	20,000	1,000	400	800	500	5	800	10	*	..	*	..	
	30,000	20	4,000	15,000	..	5	1,000	500	20,000	1,100	..	10,000	100	15	150	200	350	20	..	5	..	10,000	..	
	5,000	150	20,000	30,000	..	..	..	8	26,000	5,000	..	40,000	..	1	1	..	200	80	2	*	..	85,000	..	
TOTAL ..	45,000	175	25,000	75,000	..	5	1,500	583	58,000	7,100	2,000	70,000	1,100	416	951	700	555	900	12	5	..	95,000	..	
RUDOLF :— Turkwei Turkana Dabossa																								
TOTAL ..																								
GRAND TOTAL ..	248,535	428	137,915	218,219	875	636	143,848	9,437	579,965	21,183	2,850	112,704	36,201	1,943	15,818	10,346	2,095	1,017	1,230	173	57	108,709	1,000	

* Not known.

Compiled from Returns of 193 Plantations.

Province and District.		Number of Estates.	Total Acreage taken up.	Total Acreage under Cultivation.	Total Acreage not Cultivated.	Acreage of Coffee (<i>Arabica</i>).		Acreage of Coffee (<i>Robusta</i>).		Acreage of Para Rubber.		Acreage of other Rubbers.		Acreage of Cacao.		Cotton.	Wheat.	Rice.	Tobacco.	Tea.	Miscellaneous Crops.		
						Under 2 years.		Over 2 years.		Under 5 years.		Over 5 years.		Under 5 years.								Over 5 years.	
						Under	Over	Under	Over	Under	Over	Under	Over	Under	Over							Under	Over
BUGANDA :—																							
Mengo	...	77	38,102	14,591	23,511	618	8,094	84	201	3,642	4,087	130	766	1,397	1,200	56	1	2	...	1	197		
Entebbe	...	18	8,283	3,486	4,797	429	1,084	5	1	1,086	824	...	80	428	262	25	...	...	...	...	137		
Masaka	...	14	6,901	1,199	5,702	34	1,248	...	65	367	28	...	...	109	18	...	...	...	...	...	15		
Mubendi	...	21	13,342	3,391	9,951	130	2,510	...	9	154	19	...	40	60	109	40	1	4	...	60	21		
Total		130	66,628	22,667	43,961	1,211	12,936	89	276	5,249	4,958	130	886	1,994	1,589	121	2	6	...	61	370		
EASTERN :—																							
Busoga	...	14	15,148	3,501	11,647	53	2,716	...	...	312	108	...	...	335	110	75	...	...	...	...	367		
Teso	...	1	100	80	20	...	...	...	...	...	...	...	...	...	...	60	...	3	2	...	15		
Total		15	15,248	3,581	11,667	53	2,716	...	...	312	108	...	...	335	110	135	...	3	2	...	382		
NORTHERN :—																							
Masindi	...	22	15,851	2,945	12,906	721	1,582	...	25	565	63	...	...	351	10	488	...	...	...	...	328		
Hoima	...	2	1,350	578	772	88	480	...	...	...	...	...	...	10	...	...	1	1	...	...	5		
Total		24	17,201	3,523	13,678	809	2,062	...	25	565	63	...	...	361	10	488	1	1	...	...	333		
WESTERN :—																							
Toro	...	24	12,842	1,408	11,434	215	1,083	...	...	...	...	...	...	32	...	...	42	...	8	...	59		
Grand Total		193	111,919	31,179	80,740	2,288	18,797	89	301	6,126	5,129	130	886	2,722	1,709	744	45	10	10	61	1,144		

(i) 4,644 acres interplanted with Coffee.

(ii) 4,297 "

(iii) 130 "

(iv) 60 "

(v) 70 "

* Under shade.

and 279 with Para.

" 822 "

" "

Mission Agriculture.

PROVINCE.	Coffee <i>Arabica</i>	Coffee <i>Robusta</i>	Para Rubber	Other Rubbers	Cacao	Cotton
	Acres					
BUGANDA	480	26	350	115	125	154
EASTERN	61	...	...	5	4	100
NORTHERN	91	...	...	1	50	166
WESTERN	26	..	...	4	...	...
TOTALS	658	26	350	125	179	420

Appendix 4.

IMPERIAL INSTITUTE OF THE UNITED KINGDOM,
THE COLONIES AND INDIA.

Report on Robusta Coffee from Uganda.

The sample of Robusta coffee which is the subject of this report was forwarded to the Imperial Institute by the Director of Agriculture at Kampala and is referred to in his letter No. 703/302 dated the 18th June, 1918.

The coffee, which was stated to represent the general crop from the Government Plantation at Kampala, was forwarded for roasting trials in accordance with the suggestion made in the Imperial Institute report dated 16th January, 1918.

Description of Sample.

The sample weighed 7 lbs. and consisted of ungraded berries, in the parchment, of small to medium size. The parchment, which was of a light straw colour, showed slight discolorations, and was in some cases split open.

The seed coats, which adhered fairly firmly on the whole, varied in colour from brown to light brownish-green. The beans were of an opaque creamy grey tint.

The berries consisted of beans 88.6 per cent, and parchment 11.4 per cent. The average weight of a single bean was 0.11 gram.

Roasting Trials.

The sample was submitted for roasting trials to experts who reported that it consisted of well-grown, heavy beans, rather small but very even in size; only a few imperfect beans were present.

The characters of the roasted coffee were pronounced to be particularly good, especially in the evenness of colour and the close, hard texture of the beans, whilst the liquor was remarkably free from any undesirable taint. The firm regarded the sample as of excellent quality and stated that it could be used freely for blending purposes.

A sample of the roasted coffee is returned with this report.

Remarks.

The present sample represents a very desirable type of coffee, which would be quite suitable for consumption in the United Kingdom. Consignments of similar quality would always be readily saleable in London.

The experts who carried out the roasting trials had previously reported on all the samples of Robusta coffee recently forwarded to the Imperial Institute from Uganda and they stated that the present sample was by far the best of the series. They suggested that it would be desirable to use this seed for propagation in Uganda.

It would be of interest to learn whether this coffee was produced by the same groups of plants as the previous samples.

12TH NOVEMBER, 1918.

Appendix 5.

IMPERIAL INSTITUTE OF THE UNITED KINGDOM,
THE COLONIES AND INDIA.

Report on Fibres from Uganda.

The six samples of fibre which are the subject of this report were forwarded to the Imperial Institute by the Director of Agriculture and are referred to in his letter No. 1100/301 dated 14th October, 1918. The fibres were stated to have been obtained in the West Nile district from uncultivated plants, and it was desired to ascertain their quality and commercial value.

Description of Samples.

"No. 1. Kamba." Native names: Bongo (Aluru), Larra (Madi and Lugwari). Locality: whole West Nile District. Stripped from branches. Weight, 1 oz.

The sample consisted of strips of brown, soft, interlaced, rather weak fibre. A piece of bark was tied up with the sample.

"No. 2. Kamba." Native names: 'Olum (Aluru), Ilo (Madi), Ologo (Lugwari). Locality: whole West Nile District. Stripped from roots of tree. Weight, $2\frac{1}{2}$ ozs.

"No. 3." Native name: Atend-Winyo (Aluru). Locality: all Alur country. Stripped from roots. Weight, $\frac{3}{4}$ oz.

Samples 2 and 3 were similar to No. 1, but No. 3 was paler in colour.

These three fibres Nos. 1, 2 and 3, all resemble ordinary bark cloth fibre, samples of which, from various sources, have been previously examined at the Imperial Institute. Although attempts have been made to utilise bark cloth fibres in textile industries it does not appear that the material has ever found a market either for this purpose or for rope-making except locally for native use. Such products could no doubt be used in this country for paper making but it is unlikely that the price obtainable for the material would be sufficiently high to render its collection profitable.

"No. 4." Native names: Nyilia (Aluru), Yi-ifi (Madi and Lugwari). Locality: principally in Madi country and Alur Midiri. Stripped from young shoots. Weight, $\frac{3}{4}$ oz.

This fibre, which had an average length of about 20 inches, was exactly similar to the Buaze fibre of Nyasaland derived from *Securidaca longipedunculata* (see Imperial Institute Selected Reports on Fibres, page 47). Although the sample is of good character it appears to have been obtained from short and much branched plants, and it would probably be difficult to clean such fibre satisfactorily. Fibre of the quality of the present sample but of greater length might be saleable in the United Kingdom as a substitute for hemp, but it seems unlikely that such material could be produced for export on a commercial scale.

"No. 5." Native names: Otwor (Aluru), Uki (Madi and Lugwari). Locality: principally Midiri and along the Nile. Cactus. Weight, 5 ozs.

The sample consisted of two thin, flat leaves about 22 inches long and a small quantity of fine pale coloured fibre, well cleaned and prepared and mostly of good strength.

There is little doubt that this fibre is derived from a species of *Sansevieria*. *Sansevieria* fibre is utilised in the United Kingdom for rope-making, but the present sample is too short to find a ready market for this purpose, as the average length should be not less than 30 inches. If fibre of this length and of the same type as the present sample can be produced in Uganda in commercial quantities it should realise a similar price to that ruling for Sisal hemp, which before the war was worth about £27 per ton in London and is now quoted at about £65 per ton (March, 1919).

"No. 6." Native name: Omu (Aluru). Locality: found chiefly in Lendu country. A vine. Weight, $\frac{1}{2}$ oz.

A sample of pale brown, soft, rather weak interlaced bark fibre. The material resembled samples 1, 2 and 3, and the remarks made regarding these three samples apply also in this case.

Remarks.

It will be seen from the results of the examination of these samples that the only fibres likely to be of value for export are those represented by samples No. 4 ("Nyilia") and No. 5 ("Otwor") provided that well prepared fibre could be produced in commercial quantities and of suitable length for the United Kingdom market.

It would be of interest if the botanical names of the plants yielding these fibres could be furnished to the Imperial Institute. If the identity is not known botanical specimens, including flowers, should be forwarded for determination.

7TH APRIL, 1919.

Appendix B.

IMPERIAL INSTITUTE OF THE UNITED KINGDOM, THE COLONIES AND INDIA.

Report on Tobacco from Uganda.

The sample of tobacco which is the subject of this report was forwarded to the Imperial Institute by the Director of Agriculture and is referred to in his letter No. 566/322 dated the 8th May, 1918. It was stated that the sample represented ungraded White Burley tobacco grown in the Toro District of the Western Province.

Description of Sample.

The sample, which weighed $6\frac{1}{2}$ lbs., consisted of bundles of leaves varying in size from 16 by 5 to 29 by 12 inches. The leaves varied in colour from light brown to medium warm brown and had rather prominent veins; they were of thin texture and on the whole deficient in strength.

The sample was in rather damp condition and had a slight odour of ammonia, which disappeared as the tobacco dried. Most of the leaves were torn, some of them badly, and many showed greenness and weak papery patches.

Results of Examination.

The sample as received contained 22·6 per cent of moisture. The tobacco was submitted to chemical examination with the following results which are calculated for a normal of moisture, viz., 14 per cent:—

	Per cent.
Moisture	14·0
Nicotine	1·92
Nitrogen	3·19
Ash	19·2
The ash was analysed and found to contain:—	
	Per cent.
Lime	23·13
Magnesia	5·76
Potash	28·93
Soda	0·58
Sulphates, expressed as sulphuric acid	3·73
Chlorides, expressed as chlorine	1·43
Carbonates, expressed as carbon dioxide	19·87

The above results show that this sample of White Burley leaf is of satisfactory composition. The amount of nitrogen is low and the percentage of potash high, indicating that the tobacco would be likely to possess good smoking qualities.

Commercial Valuation.

The sample was submitted to a firm of manufacturers, who expressed the opinion that in appearance and colour the tobacco would make a fair substitute for the lower grades of American Burley Leaf. They stated, however, that the quality of the leaf was poor and thin and that the large proportion of stalk would lead to a heavy loss in stripping.

At the present time there is a great scarcity of Burley Leaf both in the United Kingdom and in America, and prices are accordingly far higher than in normal times. Under present conditions this tobacco from Uganda would realise from 12d. to 14d. per lb. in London (February, 1919) if packed in thoroughly good condition.

Remarks.

The presence of greenness and weak patches in the leaves indicates a somewhat faulty curing, and on the whole the appearance of the sample is rather poor. The tobacco was stated to have been grown as a cigar leaf, and to be ungraded. White Burley is sometimes used as a cigar wrapper, but the colour and lack of strength of the present sample render it of poor quality for this purpose. It has, however, good burning properties and could be utilised in the United Kingdom as a pipe tobacco, for which purpose it would have to be shipped in good dry condition containing about 12 to 14 per cent of moisture.

7TH MARCH, 1919.

Appendix 7.

IMPERIAL INSTITUTE OF THE UNITED KINGDOM, THE COLONIES AND INDIA.

Report on Carapa Seeds and Oil from Uganda.

The samples of Carapa seeds and oil which are the subject of this report were forwarded to the Imperial Institute by the Director of Agriculture and are referred to in his letter No. 1058/345 dated 5th October, 1918.

It was stated that the seeds had been obtained from the Kigezi District of the Western Province.

Description of Samples.

SEEDS.—This sample weighed 4 lbs. and consisted of seeds of similar appearance to those of *Carapa grandiflora* from Uganda previously examined at the Imperial Institute. The kernels of the seeds were mostly in good condition.

OIL.—This sample consisted of $\frac{3}{4}$ lb. of a cloudy viscous brown oil, containing a slight amount of solid matter which was apparently stearine. The oil had a slight characteristic odour and a strong, bitter taste.

Results of Examination.

SEEDS.—The seeds were found to consist of shell 39 per cent, and kernel 61 per cent. The kernels contained 4·3 per cent of moisture and yielded 56·6 per cent of oil, equivalent to a yield of 59·1 per cent from the dry kernels.

OIL.—The oil as received from Uganda was submitted to chemical examination with the following results, which are shown in comparison with those obtained with the oils extracted at the Imperial Institute from a previous sample of Carapa seeds from Uganda (*see* Imperial Institute Report dated 15th May, 1908):—

		<i>Present sample.</i>		<i>Previous samples.</i>	
				Cold-pressed oil.	Hot-pressed oil.
Specific gravity at 15°/15°C	...	0.9269		0.9261	0.9306
Acid value	...	12.5	...	—	—
Saponification value	...	198.9	...	198.1	201.8
Iodine value	...	82.4	...	83.7	72.6

It will be seen from these figures that the present sample of oil agrees generally in characters with the previous sample of cold-pressed oil. It is, however, somewhat inferior in appearance to the latter oil, being dark-coloured and cloudy.

Commercial Value.

The oil from these Carapa seeds would be quite suitable for soap and candle making if carefully prepared, but could not be used for edible purposes on account of its bitter taste. The residual cake or meal is also bitter and could therefore not be utilised as a feeding stuff but only as a manure; for the latter purpose its value would be approximately the same as that of Mowrah meal which before the war realised 30s. to 40s. per ton in the United Kingdom.

The present value of Carapa kernels is somewhat uncertain as the oil-seed market is in a very unsettled state owing to the recent removal of Government control. Before the war samples of the kernels were valued at £11 to £12 per ton in the United Kingdom but owing to the greatly increased price of oils their value would now be correspondingly greater. It is, however, not possible to state how long the present high values of oils will be maintained and these values cannot be taken as a basis in considering the possibility of exporting the Carapa kernels from Uganda.

Remarks.

These Carapa seeds are similar to earlier samples received at the Imperial Institute from Uganda and elsewhere, and the results of the examination of the oil confirm those previously obtained.

There is no doubt that consignments of the kernels, freed from the shells and thoroughly dried before shipment, would find a market in the United Kingdom at prices depending on the current values of oils suitable for soap and candle making. Information should therefore be supplied to the Imperial Institute as to whether the seeds are available in large quantities in Uganda so that regular supplies could be assured, and as to the price *c.i.f.* at United Kingdom port which would make the export of the dried kernels remunerative. Further action can then be taken if the prospects appear to be promising.

It would be advisable to ship the dried kernels from Uganda and not to attempt the preparation of the oil for export, as an oil of much better quality and value can be obtained by extraction of the kernels in the United Kingdom.

18TH JUNE, 1919.

Appendix 8.

IMPERIAL INSTITUTE OF THE UNITED KINGDOM, THE COLONIES AND INDIA.

Report on Cotton from Uganda.

The fifteen samples of cotton which are the subject of this report were forwarded to the Imperial Institute by the Director of Agriculture at Kampala, and are referred to in his letter No. 558/484, dated the 13th May, 1918.

It was stated that the samples had been grown on the Government Plantations at Kadunguru and Simsa in the Eastern Province.

Description of Samples.

The samples were very similar in general character and appearance, differing only very slightly in minor details such as colour, freedom from stains, amount of immature cotton present, etc. They were cream coloured, soft cottons of fair lustre, but were rather "neppy" and contained some immature fibre and a little broken leaf and seed. A few small yellow or brown stains were present in most of the samples.

The length and strength of each of the samples are shown in the following table, together with their values in Liverpool with "middling" American cotton at 16d. per lb.:—

Sample Number.		Length of Staple.	Strength.	Value Pence per lb.
1 (Kadunguru, Sunflower No. 7.)	..	0.9 to 1.6 inch mostly 1.2 to 1.4 inch	Fairly good	.. 21.00
2 (" " " 16. (18).)	..	0.9 to 1.5 inch mostly 1.1 to 1.4 inch	Fair	.. 20.50
3 (" " " 14. (18).)	..	1.0 to 1.5 inch mostly 1.1 to 1.3 inch	Fair	.. 20.00
4 (" " " 13. (18).)	..	1.0 to 1.6 inch mostly 1.2 to 1.4 inch	Fairly good	.. 20.75
5 (" Nyasaland " 32.)	..	1.0 to 1.6 inch mostly 1.2 to 1.5 inch	Good	.. 21.00
6 (Simsa, Allen No. 25.)	..	1.0 to 1.5 inch mostly 1.2 to 1.4 inch	Fairly good	.. 20.75
7 (" Nyasaland No. 30.)	..	1.0 to 1.7 inch mostly 1.2 to 1.5 inch	Fairly good	.. 20.75
8 (Kadunguru, Sunflower No. 1. (14).)	..	1.0 to 1.6 inch mostly 1.2 to 1.5 inch	Fair	.. 20.25
9 (" " " 2. (18).)	..	1.0 to 1.5 inch mostly 1.2 to 1.4 inch	Fair	.. 20.50
10 (" " " 6. (18).)	..	1.0 to 1.6 inch mostly 1.2 to 1.4 inch	Fair	.. 20.00
11 (" Allen " 8. (25).)	..	1.0 to 1.5 inch mostly 1.2 to 1.3 inch	Fairly good	.. 19.75
12 (" " " 9. (25).)	..	1.1 to 1.6 inch mostly 1.3 to 1.4 inch	Fairly good	.. 20.50
13 (" Nyasaland " 10. (30).)	..	1.0 to 1.6 inch mostly 1.2 to 1.4 inch	Fairly good	.. 20.00
14 (" " " 11. (32).)	..	1.0 to 1.5 inch mostly 1.2 to 1.3 inch	Good	.. 20.50
15 (" " " 12. (32).)	..	1.1 to 1.6 inch mostly 1.3 to 1.4 inch	Good	.. 20.75

Remarks.

The present samples are closely similar in character to previous samples of cotton from Kadunguru examined at the Imperial Institute. They are of good quality and would meet with a ready sale in the United Kingdom.

4TH JUNE, 1919.

Appendix 9.

Comparative Statement of Exports from the Uganda Protectorate for the Year ended 31st March, 1919.

ARTICLES	Unit	From 1st Apr., 1918 to 31st Mar., 1919.		From 1st Apr., 1917 to 31st Mar., 1918.		INCREASE		DECREASE	
		Quantity	£	Quantity	£	Quantity	£	Quantity	£
Cotton, Ginned ...	cwts.	98,188	965,951	99,395	537,083	...	428,868	1,207	...
" Unginned ...	"	...	...	282	548	...	...	282	548
Coffee, Husked ...	"	50,460	102,658	15,362	33,278	35,098	69,380	...	...
" in Parchment ...	"	3,851	3,351	4,485	6,283	...	...	634	2,932
Rubber, Wild ...	lbs.	14,262	620	9,362	923	4,900	...	...	303
" Plantation ...	"	253,063	12,893	144,727	9,965	108,336	2,928	...	...
Silk, Raw ...	"	...	...	900	100	...	...	900	100
Cacao ...	cwts.	209	331	114	188	95	193	...	...
Chillies ...	"	5,487	6,847	9,287	18,586	...	...	3,800	11,739
Ground Nuts ...	"	896	562	954	464	...	98	58	...
Cotton Seed ...	"	33,223	6,149	44,021	7,402	...	...	10,798	1,253
Castor Oil Seed ...	"	737	468	329	171	408	297	...	...
Simsim Seed ...	"	939	1,008	17,337	13,048	...	...	16,398	12,040
" Oil ...	"	27	99	230	530	...	...	203	431
Cotton Seed Oil ...	"	448	837	...	...	448	837	...	...
Ghee (Clarified Butter) ...	"	6,443	26,122	7,090	23,270	...	2,852	647	...
Jaggree (Unrefined Sugar) ...	"	2	3	851	668	...	...	849	665
Hides ...	"	15,053	64,125	22,634	76,707	...	...	7,581	12,582
Skins, Goat ...	"	1,948	8,162	2,273	6,789	...	1,373	325	...
" Sheep ...	"	19	15	46	41	...	...	27	26
" Miscellaneous ...	lbs.	280	29	106	10	174	19	...	...
Hippo Teeth ...	"	3,265	261	2,336	156	929	105	...	...
Horns ...	"	129	9	40	1	89	8	...	...
Ivory ...	"	94,795½	37,918	109,426½	43,770	...	...	14,631	5,852
Timber ...	cwts.	3,040	1,939	778	411	2,262	1,528	...	...
Animals, living ...	No.	417	1,985	41	118	376	1,867	...	...
Miscellaneous Produce ...	value.	...	2,835	...	2,331	...	504	...	...
Goods, Manufactured, unenumerated	"	...	2,220	...	1,892	...	328	...	...
" Unmanufactured "	"	...	60	...	10	...	50	...	...
TOTALS	...	...	1,247,457	...	734,693	...	511,235	...	48,471

Net Increase £462,734.

Comparative Statement of Exports from the Uganda Protectorate.

ARTICLES.	UNIT.	Year ended 31st March, 1915.		Year ended 31st March, 1916.		Year ended 31st March, 1917.		Year ended 31st March, 1918.		Year ended 31st March, 1919.	
		Quantity.	£	Quantity.	£	Quantity.	£	Quantity.	£	Quantity.	£
Cotton, Ginned	cwts.	107,139	320,486	91,231	239,483	77,961	348,880	99,395	537,083	98,188	965,951
" Unginned	"	30,188	30,660	8,110	5,943	32	34	282	548	—	—
Coffee, Husked	"	2,103	5,542	8,691	22,714	31,186	81,323	15,362	33,278	50,460	102,658
" Parchment	"	18,998	35,463	34,547	64,488	17,473	32,616	4,485	6,283	3,851	8,351
Rubber, Wild	lbs.	—	—	5,488	554	400	40	9,362	923	14,262	620
" Plantation	"	22,064	1,888	52,304	4,362	71,995	5,856	144,727	9,965	253,083	12,893
Silk, Raw	"	12,096	231	—	—	2,100	70	900	100	—	—
Cacao	cwts.	—	—	—	—	258	562	114	138	—	331
Chillies	"	5,116	5,885	8,333	16,850	13,317	27,328	9,287	18,586	5,487	6,847
Ground Nuts	"	156	76	1,693	822	3,640	1,767	954	464	896	562
Cotton Seed...	"	180,334	18,172	104,498	9,760	109,213	10,220	44,021	7,402	33,223	6,149
Castor Seed...	"	—	—	—	—	—	—	339	171	737	468
Simsim Seed	"	8,514	4,764	39,261	21,986	38,090	21,318	17,337	13,048	989	1,008
" Oil	"	3	6	134	250	387	725	230	530	27	99
Cotton Seed Oil	"	21	25	725	870	—	—	—	—	448	837
Beeswax	"	3	17	—	2	—	—	—	—	—	—
Ghee (Clarified Butter)...	"	4,693	12,264	4,591	11,999	7,007	18,310	7,090	23,270	6,443	26,122
Jaggree (Unrefined Sugar)	"	265	159	551	329	520	310	851	668	2	3
Hides	"	16,148	54,917	18,211	64,480	19,131	52,693	22,634	76,707	15,053	64,125
Skins, Goat	"	364,348*	19,091	391,290*	18,260	398,448*	16,095	2,273	6,789	1,948	8,162
" Sheep	"	22,178*	506	10,144*	169	9,880*	126	46	41	19	15
" Calf	"	732	2,710	612	2,227	127	845	—	—	—	—
Miscellaneous	lbs.	—	—	—	—	—	—	106	10	280	29
Horns	"	221	3	12	4	—	—	40	1	129	9
Hippo Teeth	"	5,260	414	2,818 ¹	251	4,800 ¹	422	2,336	156	3,265	261
Ivory	"	12,246 ²	6,283	30,641	11,091	22,876	8,778	109,426 ³	43,770	94,795 ¹	37,918
Timber	"	1,337	585	419	151	533	567	778	411	8,040	1,939
Animals, Living	cwts.	404	920	1,179	3,467	1,865	6,131	41	118	417	1,985
Miscellaneous Produce...	value.	—	714	—	2,102	—	1,371	—	2,331	—	2,835
Goods, Manufactured, unenumerated	"	—	934	—	803	—	1,450	—	1,892	—	2,220
Goods, Unmanufactured, unenumerated	"	—	558	—	261	—	443	—	10	—	60
GRAND TOTAL	...	—	523,173	—	503,681	—	637,795	—	784,698	—	1,247,457

* Number.

**Comparative Statement of Exports—the Produce of the Uganda Protectorate—showing Quantities and Values
from the various Ports and Stations, for the Years ended 31st March, 1918 and 1919.**

ARTICLES.	Unit.	BUKAKATA.			ENTEBBE.			KAMPALA.			KIBANGA.				
		Year ended 31-3-19.		Year ended 31-3-18.	Year ended 31-3-19.		Year ended 31-3-18.	Year ended 31-3-19.		Year ended 31-3-18.	Year ended 31-3-19.		Year ended 31-3-18.		
		Quantity.	£		Quantity.	£		Quantity.	£		Quantity.	£			
Cotton, Ginned	Cwts.	13	38	—	70*	6	144	750	25,938	256,246	23,174	125,119	—	—	—
" Unginned	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coffee, Husked	"	315	570	956	2,158	4,465	623	1,303	27,046	56,436	8,795	20,242	18,234	35,375	3,243
" in Parchment	"	—	—	—	—	—	431	677	1,717	1,604	3,739	5,202	—	—	5,625
Rubber, Wild	Lbs.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" Plantation	"	—	—	—	22,316	1,111	23,744	1,583	110,716	5,220	63,392	4,332	18,796	1,169	112
Silk, Raw	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cacao	Cwts.	—	—	—	24	39	39	45	79	122	900	100	66	96	—
Chillies	"	6	9	—	11	12	—	—	1,391	1,752	715	1,419	—	—	—
Ground Nuts	"	—	—	—	—	—	—	—	82	104	—	—	—	—	—
Cotton Seed	"	220	33	—	—	—	680	64	5,804	1,016	15,180	2,479	—	—	—
Castor Oil Seed	"	—	—	—	—	—	—	—	737	468	329	171	—	—	—
Simsim Seed	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" Oil	"	—	—	—	—	—	—	—	—	—	3	6	—	—	—
Cotton Seed Oil	"	—	—	—	—	—	—	—	448	837	—	—	—	—	—
Ghee (Clarified Butter)	"	3,369	13,709	3,259	29	108	78	273	2,639	10,721	3,106	9,878	—	—	—
Jaggree (Unrefined Sugar)	"	—	—	—	—	—	374	292	—	—	36	27	—	—	—
Hides	"	1,555	6,541	2,392	—	—	26	66	7,625	32,879	9,294	31,864	—	—	—
Skins, Goat	"	27	120	30	—	—	—	—	786	3,371	1,061	3,210	—	—	—
" Sheep	"	—	—	2	—	—	—	—	—	—	18	16	—	—	—
" Miscellaneous	Lbs.	—	—	—	40	8	—	—	230	21	96	8	—	—	—
Hippo Teeth	"	124	6	70	—	—	127	8	772	64	499	33	—	—	—
Horns	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ivory	"	—	—	—	—	—	—	—	—	—	40	1	—	—	—
Timber	"	4,345	1,737	555	358	143	—	—	70,519	28,209	94,209½	37,684	—	—	—
Miscellaneous Produce	Cwts.	63	39	—	374	243	63	30	1,655	1,034	715	381	—	—	—
Goods Manufactured, Unenumerated	Value	—	1,066	—	—	29	—	79	—	1,007	—	452	—	—	—
" Unmanufactured,	"	—	817	—	—	29	—	11	—	855	—	1,438	—	—	—
Animals, Living	No.	334	1,720	—	—	5	—	1	75	14	6	2	—	—	—
TOTALS	...	—	26,413	—	—	6,198	—	5,182	—	402,237	—	244,070	—	36,640	5,737

* lbs.

COMPARATIVE STATEMENT OF EXPORTS—THE PRODUCE OF THE UGANDA PROTECTORATE—SHOWING QUANTITIES AND VALUES
FROM THE VARIOUS PORTS AND STATIONS, FOR THE YEARS ENDED 31ST MARCH, 1918 AND 1919.—continued.

ARTICLES.	Unit.	JINJA.			MWANJ.			OTHER PORTS AND STATIONS.				TOTALS.			
		Year ended 31-3-19.		Quantity.	Year ended 31-3-18.		Quantity.	Year ended 31-3-19.		Year ended 31-3-18.		Year ended 31-3-19.		Year ended 31-3-18.	
		£	Quantity.		£	Quantity.		£	Quantity.	£	Quantity.	£	Quantity.	£	Quantity.
Cotton, Ginned	Cwts.	51,082	520,379	51,420	284,857	1,608	15,426	19,547	191,856	24,657	126,357	98,188	965,951	99,395	537,083
" Unginned	"	1,675	3,527	—	—	89	—	—	—	—	—	—	—	282	548
Coffee, Husked	"	1,862	1,579	1,721	3,986	272	173	943	2,112	24	45	50,460	102,658	15,362	33,278
" in Parchment	"	14,262	620	9,362	923	—	168	—	—	60	50	3,851	3,851	4,485	6,283
Rubber, Wild	Lbs.	101,235	5,393	55,911	3,938	—	—	—	—	—	—	14,262	9,362	923	923
" Plantation	"	—	—	—	—	—	—	—	—	—	—	253,063	12,893	144,727	9,965
Silk, Raw	"	—	—	—	—	—	—	—	—	—	—	—	—	900	100
Cacao	Cwts.	40	74	72	88	—	—	—	—	—	—	209	—	331	138
Chillies	"	4,060	5,050	8,502	17,020	—	—	19	21	70	147	5,487	6,847	9,287	18,586
Ground Nuts	"	148	71	605	295	160	141	506	246	—	—	896	562	954	464
Cotton Seed	"	21,749	4,212	19,101	2,696	—	—	5,450	888	8,780	2,093	33,223	6,149	44,021	7,402
Castor Oil Seed	"	—	—	—	—	—	—	—	—	—	—	737	468	329	171
Simsim Seed	"	326	365	6,066	4,585	—	—	613	643	9,329	7,087	939	1,008	17,337	13,048
" Oil	"	12	44	216	496	15	55	—	—	11	28	27	99	230	530
Cotton Seed Oil	"	—	—	—	—	—	—	—	—	—	—	448	837	—	—
Ghee (Clarified Butter)	"	190	739	291	981	155	607	61	238	72	236	6,443	26,122	7,090	23,270
Jaggree (Unrefined Sugar)	"	2	3	441	349	—	—	—	—	—	—	2	3	851	668
Hides	"	4,551	19,100	8,647	29,685	1,290	5,472	32	133	20	53	15,053	64,125	22,634	76,707
Skins, Goat	"	906	3,702	953	2,828	125	516	104	453	17	49	1,948	8,162	2,273	6,789
" Sheep	"	19	15	20	18	—	—	—	—	4	4	19	15	46	41
" Miscellaneous	Lbs.	—	—	—	—	10	—	—	—	—	—	280	29	106	10
Hippo Teeth	"	2,211	183	948	64	—	—	158	8	—	—	3,265	261	2,336	156
Horns	"	120	4	—	—	—	—	9	5	—	—	129	9	40	1
Ivory	"	2,197	879	3,442	1,376	—	—	17,376	6,950	11,048	4,419	94,795	37,918	109,426	43,770
Timber	Cwts.	946	622	—	630	2	1	—	—	—	—	3,040	1,939	778	411
Miscellaneous Produce	Value	—	606	—	—	—	90	—	37	—	189	—	2,835	—	2,331
Goods Manufactured,	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unenumerated	"	—	58	—	20	—	6	—	455	—	60	—	2,220	—	1,892
Goods Unmanufactured,	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unenumerated	"	—	26	—	6	—	5	—	2	—	—	—	60	60	10
Animals, Living	No.	—	8	—	—	—	—	—	—	—	—	417	1,985	41	118
TOTALS	...	—	549,259	—	355,195	—	22,660	—	204,050	—	140,817	—	1,247,457	—	784,693

Details of Exports from other Ports and Stations are as follows:—

ARTICLES.	Unit.	LUZINGA		MBULAMUTI		NAMASAGALI		MASINDI PORT		ATURA		KELLE		LALLI		BUGONDO		AGU		KISUBI		TOTALS	
		Quantity	£	Quantity	£	Quantity	£	Quantity	£	Quantity	£	Quantity	£	Quantity	£	Quantity	£	Quantity	£	Quantity	£	Quantity	£
Cotton, Ginned	Cwts.	...	...	7,301	70,986	...	...	...	...	...	...	...	...	5,395	55,651	2,954	27,842	3,957	37,377	...	...	19,547	191,856
Coffee, Husked	"	...	...	...	...	...	...	943	2,112	...	...	...	...	...	...	...	...	...	...	...	...	943	2,112
Chillies	"	19	24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	19	24
Cotton Seed	"	...	...	237	35	...	...	...	...	...	...	...	...	3,422	511	352	46	1,489	296	...	...	5,450	888
Simsim	"	...	...	...	...	...	...	...	...	613	643	...	...	...	...	...	...	...	...	...	...	613	643
Ghee	"	...	...	17	67	4	18	...	...	...	...	...	...	...	...	...	...	40	153	...	...	61	238
Hides	"	...	...	32	133	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	32	133
Skins, Goat	"	...	...	104	453	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	104	453
Ground Nuts	"	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	506	246	...	...	506	246
Ivory	lbs.	...	...	...	...	...	...	17,376	6,950	...	...	...	...	...	...	...	...	...	...	...	...	17,376	6,950
Horns	"	...	...	...	...	...	...	9	5	...	...	...	...	...	...	...	...	...	...	...	...	9	5
Hippo Teeth	"	...	...	...	...	...	...	158	8	...	...	...	...	...	...	...	...	...	...	...	...	158	8
Miscellaneous Produce	Value	...	...	...	...	...	1	...	2	...	...	...	32	...	2	...	...	...	...	...	...	...	37
Goods Manufactured, unenumerated	"	...	...	...	8	...	...	...	95	...	...	...	...	...	...	5	...	...	...	...	...	...	455
Goods Unmanufactured, unenumerated	"	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
TOTALS	...	...	24	...	71,679	...	19	...	9,172	...	643	...	32	...	56,164	...	27,893	...	38,072	...	352	...	204,050

N.B.—All Produce from the above Ports and Stations, except from Kisubi, passes through Jinja Port.

ENTEBBE METEOROLOGICAL STATEMENT FOR THE YEAR 1918.

Lat. 0° 4' 31" N. Long. 32° 28' 30" E. Height of Barometer above M. S. L. 3842 Feet.

			AT 7 A.M.				AT 2 P.M.				AT 9 P.M.				Rainfall.	Sunshine.	Minimum Temperature.	Maximum Temperature.	No. of days Rain fell.
MONTH.			Barometer corrected and reduced to 32° F.	Attached Thermometer.	Dry Bulb.	Wet Bulb.	Barometer corrected and reduced to 32° F.	Attached Thermometer.	Dry Bulb.	Wet Bulb.	Barometer corrected and reduced to 32° F.	Attached Thermometer.	Dry Bulb.	Wet Bulb.					
1918.			In.	°	°	°	In.	°	°	°	In.	°	°	°	In.	hrs. mts.	°	°	
JANUARY	...	...	26.183	70.1	68.5	64.1	26.149	79.0	77.7	72.9	26.167	70.6	69.0	64.9	2.07	5.44	64.5	80.3	10
FEBRUARY	...	...	26.192	71.0	68.9	65.8	26.162	79.6	78.1	71.7	26.159	72.2	70.5	67.3	1.07	6.33	62.6	81.6	7
MARCH	...	...	26.217	71.9	70.2	67.1	26.177	81.7	79.5	73.5	26.176	73.9	72.4	68.3	3.59	5.29	66.5	82.1	15
APRIL	...	...	26.182	68.9	67.1	65.0	26.145	80.4	76.0	72.3	26.148	69.3	68.1	65.6	10.88	3.04	62.9	78.6	23
MAY	...	...	26.207	73.7	68.1	65.6	26.176	80.6	76.1	68.4	26.182	69.5	69.6	65.9	9.05	3.44	63.0	78.1	11
JUNE	...	...	26.226	71.6	67.4	64.5	26.203	77.9	73.7	67.0	26.201	69.6	67.3	64.5	5.17	5.41	62.0	75.8	18
JULY	...	...	26.243	69.4	66.9	63.7	26.224	79.0	74.8	67.9	26.232	68.8	68.7	65.1	1.89	7.47	61.6	76.4	7
AUGUST	...	...	26.255	69.3	65.3	64.0	26.232	79.0	75.1	71.4	26.229	67.9	68.2	66.7	1.75	6.03	61.5	77.3	10
SEPTEMBER	...	...	26.230	69.3	65.1	63.1	26.189	81.3	77.1	69.3	26.184	69.6	69.7	65.8	3.21	5.31	62.0	80.3	9
OCTOBER	...	...	26.199	71.7	66.3	64.1	26.169	82.1	77.4	70.7	26.182	72.1	71.3	65.9	3.05	6.09	61.9	81.3	7
NOVEMBER	...	...	26.173	69.7	67.0	65.3	26.140	81.7	77.5	72.6	26.156	70.0	69.9	67.3	4.84	5.08	62.3	79.5	15
DECEMBER	...	...	26.176	70.5	66.4	64.2	26.134	83.9	79.3	71.6	26.148	71.3	71.3	67.6	2.41	7.11	63.8	81.3	13
MEAN FOR YEAR			26.207	70.6	67.3	64.7	26.175	80.5	76.9	70.8	26.180	70.4	67.7	66.2	48.98	5.40	62.9	79.4	TOTAL 145

MASAKA Meteorological Statement for the Year 1918.

MONTH.	7 A.M.		2 P.M.		9 P.M.		Maximum Tempera- ture.	Minimum Tempera- ture.	Rain.	No. of days rain fell.
	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.				
1918.	o	o	o	o	o	o	o	o	In.	
JANUARY ...	60.5	58.4	77.7	67.2	63.5	59.9	79.7	59.2	1.33	8
FEBRUARY ...	62.3	60.1	76.0	69.0	62.8	60.8	80.0	57.2	1.62	6
MARCH ...	63.4	61.2	77.6	72.1	62.1	60.0	80.3	59.5	2.03	9
APRIL ...	62.2	60.8	75.3	71.4	61.5	59.8	78.7	60.5	5.01	19
MAY ...	†61.7	†60.0	*74.9	*69.7	*60.9	*59.2	*77.8	*60.0	3.91	13
JUNE ...	§62.2	§60.3	§73.8	§66.6	§61.0	§59.8	§76.9	§60.1	2.02	9
JULY ...	62.4	60.4	76.2	66.7	61.4	60.0	78.7	60.5	Nil	—
AUGUST ...	61.6	60.3	76.7	66.4	60.8	59.9	78.6	60.4	0.60	6
SEPTEMBER ...	63.3	61.3	78.1	67.8	61.9	60.5	80.2	60.6	1.61	5
OCTOBER ...	62.8	60.9	76.7	69.3	62.4	60.7	79.2	60.4	1.24	8
NOVEMBER ...	†63.3	†61.6	†77.4	†68.3	†64.6	†62.2	†80.6	†61.0	1.70	7
DECEMBER ...	63.1	61.3	79.8	67.1	65.0	62.5	81.4	60.3	1.35	10
MEAN FOR YEAR	62.4	60.6	76.7	68.6	62.3	60.4	79.3	60.0	TOTAL 22.42	100

JINJA Meteorological Statement for the Year 1918.

MONTH.	7 A.M.		2 P.M.		9 P.M.		Maximum Tempera- ture.	Minimum Tempera- ture.	Rain.	No. of days rain fell.
	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.				
1918.	o	o	o	o	o	o	o	o	In.	
JANUARY ...	65.9	62.5	82.4	66.5	68.8	65.5	88.0	63.0	1.74	6
FEBRUARY ...	65.5	63.8	86.3	70.1	67.1	64.0	85.7	63.4	0.22	1
MARCH ...	65.6	63.1	83.1	69.0	66.9	64.6	84.2	64.2	1.18	4
APRIL ...	66.4	64.6	85.5	71.5	67.0	65.1	87.4	66.4	3.74	15
MAY ...	67.0	65.4	85.8	71.5	65.5	64.4	87.9	63.9	2.42	7
JUNE ...	65.6	64.7	86.3	70.9	65.1	64.0	88.4	64.0	1.78	6
JULY ...	66.9	64.6	82.6	70.9	65.7	64.1	85.8	61.9	2.14	6
AUGUST ...	64.1	63.0	77.9	70.1	65.3	63.5	83.0	62.4	2.16	6
SEPTEMBER ...	65.4	64.1	83.8	70.1	65.7	64.3	87.5	61.6	3.37	9
OCTOBER ...	67.4	65.5	82.1	71.4	66.7	64.5	87.5	63.9	4.38	10
NOVEMBER ...	63.7	62.4	80.1	68.5	65.6	64.4	81.2	60.2	3.10	7
DECEMBER ...	64.5	63.3	85.3	68.0	64.4	64.0	83.4	62.5	2.36	7
MEAN FOR YEAR	65.7	63.9	83.4	69.9	66.2	64.4	85.8	63.1	TOTAL 28.59	84

MBARARA Meteorological Statement for the Year 1918.

MONTH.	7 A.M.		2 P.M.		9 P.M.		Maximum Tempera- ture.	Minimum Tempera- ture.	Rain.	No. of days rain fell.
	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.				
1918.	o	o	o	o	o	o	o	o	In.	
JANUARY ...	63.9	61.2	72.7	65.6	66.2	63.2	80.8	61.6	2.20	7
FEBRUARY ...	64.2	61.3	78.8	64.7	67.1	63.8	81.0	55.8	1.36	6
MARCH ...	64.4	61.7	78.6	65.6	66.6	63.6	80.5	57.9	2.83	9
APRIL ...	62.9	60.7	72.3	64.6	63.4	63.7	76.5	57.1	2.53	11
MAY ...	64.2	61.4	70.6	65.2	67.5	64.2	78.2	55.5	1.37	8
JUNE ...	64.9	60.3	76.4	64.1	64.5	61.6	78.3	56.4	1.93	4
JULY ...	61.3	59.8	77.9	62.9	64.4	60.3	79.9	58.4	0.94	3
AUGUST ...	64.5	60.7	75.6	63.1	64.5	59.7	80.2	59.0	0.83	5
SEPTEMBER ...	66.1	62.2	76.8	65.0	62.2	59.4	80.3	58.7	1.85	9
OCTOBER ...	67.6	63.1	75.1	64.8	62.5	60.0	78.6	59.1	2.75	13
NOVEMBER ...	67.0	63.5	75.5	65.4	62.0	63.1	78.5	59.1	2.45	9
DECEMBER ...	65.0	62.5	77.1	61.7	62.0	60.0	79.2	58.6	3.32	10
MEAN FOR YEAR	64.7	61.5	75.6	64.4	64.4	61.9	79.3	58.1	TOTAL 25.36	94

* Records for 18 days. † Records for 19 days. ‡ Records for 23 days. § Records for 24 days.

FORT PORTAL Meteorological Statement for the Year 1918.

MONTH.		7 A.M.		2 P.M.		Maximum Tempera- ture.	Minimum Tempera- ture.	Rain.	No. of days rain fell
		Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.				
1918.		o	o	o	o	o	o	In.	
JANUARY	...	65.5	60.0	73.4	66.4	76.7	50.9	1.06	6
FEBRUARY	...	61.5	59.5	67.3	65.0	79.3	50.8	0.53	2
MARCH	...	62.0	57.8	72.0	65.5	72.0	43.9	9.37	21
APRIL	...	66.9	61.7	69.0	62.0	70.9	58.5	15.52	25
MAY	...	66.0	61.1	72.6	66.4	78.5	53.4	2.84	14
JUNE	...	63.0	56.6	71.0	64.3	78.0	50.5	3.30	8
JULY	...	63.7	58.5	71.1	64.2	76.7	51.9	0.47	4
AUGUST	...	65.0	57.8	68.1	63.2	76.4	52.5	4.34	9
SEPTEMBER	...	64.8	61.6	72.3	64.0	76.3	54.2	10.24	22
OCTOBER	...	64.3	61.5	70.8	63.6	75.4	53.6	6.02	23
NOVEMBER	...	64.5	62.0	70.7	69.3	74.4	54.0	6.58	22
DECEMBER	...	61.7	61.3	61.3	64.5	77.0	56.7	4.95	12
MEAN FOR YEAR		64.1	60.0	70.0	64.9	76.0	52.6	TOTAL 65.23	168

GULU Meteorological Statement for the Year 1918.

MONTH.		7 A.M.		2 P.M.		Maximum Tempera- ture.	Minimum Tempera- ture.	Rain.	No of days rain fell
		Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.				
1918.		o	o	o	o	o	o	In.	
JANUARY	...	69.6	59.7	83.0	63.5	84.7	65.5	0.16	1
FEBRUARY	...	71.5	61.0	86.3	64.3	87.7	68.0	0.34	3
MARCH	...	74.6	65.7	86.1	67.0	88.0	70.3	1.23	5
APRIL	...	70.3	66.7	80.0	67.0	82.0	64.0	4.33	7
MAY	...	71.0	67.4	80.6	69.7	82.8	62.5	3.11	7
JUNE	...	67.0	65.5	79.5	73.6	82.0	63.0	6.31	14
JULY	...	68.9	66.2	79.8	71.8	83.4	63.0	2.04	5
AUGUST	...	70.4	67.4	79.3	70.9	85.3	64.3	3.20	11
SEPTEMBER	...	70.5	67.8	79.9	69.7	85.8	63.2	3.66	11
OCTOBER	...	71.5	68.0	82.4	72.8	88.2	64.1	3.06	6
NOVEMBER	...	71.6	68.7	84.0	72.9	90.5	64.8	5.47	11
DECEMBER	...	71.7	68.7	84.8	72.7	92.2	63.9	1.32	4
MEAN FOR YEAR		70.7	66.1	82.1	69.7	86.1	64.7	TOTAL 34.22	85

KAMPALA Meteorological Statement for the Year 1918.

MONTH.		7 A.M.		2 P.M.		Maximum Tempera- ture.	Minimum Tempera- ture.	Rain.	No. of days rain fell.
		Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.				
1918.		o	o	o	o	o	o	In.	
JANUARY	...	66.0	63.2	80.0	72.5	83.2	62.2	1.37	8
FEBRUARY	...	66.5	63.9	83.8	73.1	84.7	62.5	0.56	4
MARCH	...	67.0	64.9	80.6	73.5	83.1	63.5	1.97	11
APRIL	...	65.8	64.3	76.1	71.1	78.8	63.2	5.48	19
MAY	...	65.1	64.0	76.3	71.7	77.8	63.3	4.93	13
JUNE	...	64.8	63.3	76.0	70.8	77.6	63.3	3.29	11
JULY	...	65.7	64.0	76.3	72.0	78.2	64.6	0.89	4
AUGUST	...	64.9	63.4	75.1	70.1	78.0	64.5	4.55	12
SEPTEMBER	...	65.9	64.0	78.2	71.6	82.0	65.3	3.47	10
OCTOBER	...	66.8	64.7	80.4	73.0	85.0	66.3	2.64	14
NOVEMBER	...	66.2	64.7	82.3	75.5	85.9	66.2	1.50	12
DECEMBER	...	67.2	68.7	83.6	67.0	79.1	78.5	0.78	7
MEAN FOR YEAR		66.0	64.2	79.0	71.8	81.1	65.3	TOTAL 32.37	125

MBALE Meteorological Statement for the Year 1918.

MONTH.	7 A.M.		2 P.M.		9 P.M.		Maximum Tempera- ture.	Minimum Tempera- ture.	Rain.	No. of days rain fell.
	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.				
1918	o	o	o	o	o	o	o	o	In.	
JANUARY ...	65.0	63.8	85.0	83.9	75.3	74.3	85.5	59.9	0.24	2
FEBRUARY ...	65.6	64.6	86.9	85.4	75.4	74.4	87.5	59.9	0.84	3
MARCH ...	66.9	65.9	87.6	86.5	82.2	80.6	89.3	60.1	0.46	3
APRIL ...	65.8	64.8	85.1	84.1	77.8	76.2	85.6	60.0	4.75	5
MAY ...	65.3	64.1	83.3	82.3	78.9	76.8	84.7	60.0	8.36	4
JUNE ...	66.1	65.0	84.6	83.6	77.2	76.2	85.0	60.0	5.67	16
JULY ...	66.1	65.1	84.7	83.7	78.0	76.6	85.2	60.0	4.91	5
AUGUST ...	66.4	65.1	84.5	83.3	78.0	76.8	85.2	60.0	5.54	6
SEPTEMBER	72.3	70.2	88.5	86.5	77.7	75.7	88.6	61.9	1.54	10
OCTOBER ...	72.6	70.6	82.2	78.7	70.5	68.5	88.0	62.3	2.21	11
NOVEMBER...	—	—	—	—	—	—	—	—	—	—
DECEMBER ..	—	—	—	—	—	—	—	—	—	—
MEAN FOR YEAR	67.2	65.9	85.2	83.8	77.1	75.6	86.5	60.4	TOTAL 34.52	65

MUBENDI Meteorological Statement for the Year 1918.

MONTH.	7 A.M.		2 P.M.		9 P.M.		Maximum Tempera- ture.	Minimum Tempera- ture.	Rain.	No. of days rain fell.
	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.	Dry Bulb.	Wet Bulb.				
1918.	o	o	o	o	o	o	o	o	In.	
JANUARY ...	66.7	59.3	73.3	60.3	69.7	60.4	79.3	65.3	1.14	5
FEBRUARY ...	67.1	59.5	74.6	62.9	71.2	61.0	81.5	65.7	1.20	2
MARCH ...	66.4	60.7	74.8	63.7	69.4	62.8	81.2	63.8	2.40	3
APRIL ...	62.8	59.5	67.6	61.6	64.6	59.0	75.7	61.8	8.05	12
MAY ...	65.3	61.4	70.7	63.8	66.3	62.2	77.4	63.4	6.65	11
JUNE ...	63.5	58.8	71.3	62.9	65.8	61.4	79.5	62.2	2.17	9
JULY ...	64.8	58.6	71.0	62.1	66.6	60.5	79.1	63.4	0.95	3
AUGUST ...	65.1	61.1	70.6	64.4	66.2	62.6	77.6	62.3	5.65	14
SEPTEMBER	67.3	62.2	73.0	64.8	68.3	62.3	79.4	63.8	4.11	11
OCTOBER ...	66.8	61.5	72.6	65.6	69.0	63.6	79.3	63.7	6.20	15
NOVEMBER...	66.9	62.0	73.3	66.0	69.5	63.4	80.3	64.7	3.21	17
DECEMBER...	67.9	65.1	75.6	66.4	70.0	63.8	81.6	65.8	2.00	8
MEAN FOR YEAR	65.9	60.8	72.8	63.7	68.1	61.9	79.3	63.8	TOTAL 43.73	110

MASINDI Meteorological Statement for the Year 1918.

MONTH.		Maximum Temperature.	Minimum Temperature.	Rain.	No. of days rain fell.
1918.		o	o	In.	
JANUARY	...	84.5	61.5	Nil	—
FEBRUARY	...	84.7	61.9	Nil	—
MARCH	...	84.2	61.6	2.66	10
APRIL	...	85.5	61.7	10.06	16
MAY	...	84.8	61.8	5.44	18
JUNE	...	85.2	61.4	1.65	6
JULY	...	84.7	61.7	5.92	9
AUGUST	...	83.5	61.0	6.45	16
SEPTEMBER	...	84.7	60.9	3.70	12
OCTOBER	...	84.9	61.3	4.42	16
NOVEMBER	...	84.1	60.7	8.66	15
DECEMBER	...	85.7	61.4	0.67	4
MEAN FOR YEAR ...		84.7	61.4	TOTAL 49.63	122

Comparative Rainfall Statement, showing the Monthly Rainfall for the Year 1918, of Fifty-two Localities of the Uganda Protectorate.

MONTH.	Entebbe.		Jinja.		Mbarara.		Masaka.		Fort Portal.		Butiaba.		Masindi.		Gulu.		Kampala.		Mbale.		Mubendi.		Budo.		Bukona.	
	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days
JANUARY	2'07	10	1'74	6	2'20	7	1'33	8	1'06	6	Nil	...	Nil	...	0'16	1	1'37	8	0'24	2	1'14	5	1'90	5	0'70	5
FEBRUARY	1'07	7	0'22	1	1'36	6	1'62	6	0'53	2	0'10	...	Nil	...	0'34	3	0'56	4	0'84	3	1'20	2	0'94	5	0'53	4
MARCH	3'59	15	1'18	4	2'83	9	2'03	9	9'37	21	0'29	3	2'16	10	1'23	5	1'97	11	0'46	3	2'40	3	2'80	...	1'42	8
APRIL	10'88	23	3'74	15	2'53	11	5'01	19	15'52	25	4'79	10	10'06	16	4'33	7	5'41	19	4'75	5	8'05	12	7'29	13	6'90	16
MAY	9'05	11	2'42	7	1'37	8	3'91	13	2'84	14	6'45	7	5'44	18	3'11	7	4'93	13	8'36	14	4'25	13	4'25	13	7'16	16
JUNE	5'17	13	1'78	6	1'93	4	2'02	9	3'30	8	0'99	1	1'65	6	6'31	14	3'29	11	5'67	6	2'17	9	3'57	8	1'10	10
JULY	1'89	7	2'14	6	0'94	3	Nil	...	0'47	4	3'60	4	5'92	9	2'04	5	0'89	4	4'91	5	0'95	3	3'12	7	2'67	11
AUGUST	1'75	10	2'16	6	0'83	5	0'60	5	4'34	9	5'88	5	6'45	16	3'20	11	4'55	12	5'54	6	5'65	14	...	...	2'71	17
SEPTEMBER	3'21	9	3'37	9	1'85	9	1'61	5	10'24	22	0'74	4	3'70	12	3'66	11	3'47	10	1'54	10	4'11	11	2'45	9	4'54	20
OCTOBER	3'05	7	4'38	10	2'75	13	1'24	8	6'02	23	2'18	8	4'42	16	3'06	6	2'64	14	2'21	11	6'20	15	1'91	8	3'44	11
NOVEMBER	4'84	15	3'10	7	2'45	9	1'70	7	6'58	22	2'67	7	8'66	15	5'47	11	1'50	12	...	...	3'21	17	1'77	7	4'89	14
DECEMBER	2'41	13	2'36	7	3'32	10	1'35	10	4'96	12	0'40	2	0'67	4	1'31	4	1'79	7	...	...	2'00	8	1'47	3	2'41	11
TOTAL	48'98	145	28'59	84	24'36	94	22'42	100	65'23	168	28'09	52	49'63	122	34'22	85	32'37	125	34'52	65	43'73	110	33'31	85	38'47	143

MONTH.	Namenage.		Lira.		Soroti.		Hoima.		Namukekera.		Iganga.		Butiti.		Bukumi.		Rubaga.		Ngora.		Kisubi.		Kivuvu.		Kawalongojo.	
	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days
JANUARY	0'10	1	0'14	1	0'26	2	0'80	1	0'64	3	0'40	1	0'80	3	0'12	5	1'60	4	0'06	1	2'00	7	2'24	6	1'39	3
FEBRUARY	1'27	2	1'02	3	0'27	3	0'73	3	0'19	3	0'35	1	1'65	5	0'04	3	1'03	2	1'01	3	1'23	3	1'66	5	2'07	7
MARCH	4'08	7	1'51	3	1'46	4	2'79	15	2'08	5	...	...	6'82	15	2'12	20	1'70	4	0'43	2	5'94	10	2'30	7	3'59	10
APRIL	8'70	17	4'91	18	9'05	14	9'59	15	6'43	17	...	...	4'17	20	2'79	20	5'32	8	5'02	15	11'45	19	7'01	17	8'93	25
MAY	6'29	12	3'66	8	4'93	11	6'22	10	2'44	9	...	...	5'21	8	3'63	18	5'10	8	6'40	16	7'76	10	5'41	12	4'55	16
JUNE	1'50	2	7'05	18	3'55	13	5'96	13	4'99	13	...	...	1'67	6	2'18	12	2'40	2	6'96	12	6'68	8	6'35	12	2'56	13
JULY	1'89	5	2'50	4	2'14	10	1'20	6	1'26	7	...	...	2'23	7	1'03	8	1'18	1	2'16	9	1'55	2	2'88	11	3'45	6
AUGUST	4'10	10	3'79	11	8'80	16	7'47	17	3'25	12	...	...	2'16	10	4'97	19	2'60	4	8'87	14	1'19	5	6'35	11	3'45	15
SEPTEMBER	6'75	11	3'41	8	1'33	7	4'12	15	2'59	12	4'41	8	3'34	12	4'02	13	3'54	4	1'52	7	1'43	5	4'50	11	7'19	14
OCTOBER	4'81	8	2'70	5	3'00	9	8'61	20	3'90	14	3'98	6	9'61	21	6'04	18	1'50	3	2'50	7	3'68	5	3'44	11	4'07	14
NOVEMBER	1'35	3	5'39	8	5'14	6	3'13	14	2'63	12	4'25	7	6'04	15	4'45	10	2'00	2	3'52	6	4'91	8	1'31	6	3'07	14
DECEMBER	1'16	2	0'30	1	0'11	2	1'19	7	1'63	7	...	...	6'38	14	1'53	5	1'61	3	0'30	2	1'69	7	0'95	6	4'25	12
TOTAL	42'00	80	36'38	89	40'04	97	51'81	136	32'03	114	13'39	23	50'08	136	32'92	150	29'58	45	38'75	94	49'51	89	44'40	112	45'41	149

* Records for 17 days.

COMPARATIVE RAINFALL STATEMENT, SHOWING THE MONTHLY RAINFALL FOR THE YEAR 1918,
OF FIFTY-TWO LOCALITIES OF THE UGANDA PROTECTORATE.—continued.

MONTH.	Magigye.		Nandere.		Moniko.		Bombo.		Bwavyu.		Kakumiro.		Bunyara-guru.		Katigondo.		Masindi Port.		Nambeya.		Kitgum.		Kileleshony.		Kadunguru.	
	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days
JANUARY	0.25	1	0.99	3	1.57	4	2.10	5	2.07	9	3.01	6	0.56	3	3.08	7	Nil	...	0.84	2	Nil	...	1.05	7	0.26	2
FEBRUARY	1.61	3	0.99	3	0.53	2	1.59	5	0.85	3	1.44	2	2.84	4	1.91	5	0.23	2	0.46	1	0.13	1	1.85	7	1.05	1
MARCH	2.92	6	4.98	11	4.96	7	1.83	6	1.80	7	2.80	10	6.87	25	3.64	11	0.42	1	2.57	10	0.30	2	5.80	13	1.18	4
APRIL	11.16	19	6.80	14	4.64	10	8.18	12	4.28	15	6.42	18	6.31	18	4.54	14	7.47	13	6.90	16	2.67	8	4.72	20	...	...
MAY	5.91	9	2.97	9	4.90	15	4.95	6	6.82	13	5.33	11	3.73	12	4.63	13	5.08	8	6.21	14	5.64	7	5.39	17	...	...
JUNE	2.22	6	2.01	10	4.86	8	4.06	10	2.55	11	0.86	7	2.06	6	2.67	7	1.48	3	3.06	7	1.39	7	1.24	6	...	...
JULY	2.11	7	0.35	5	5.86	12	2.47	11	2.72	9	2.47	4	0.35	2	Nil	...	0.72	3	0.58	2	5.67	8	2.32	6	...	...
AUGUST	3.74	15	3.03	13	4.58	13	3.96	9	5.65	11	6.16	14	5.44	13	2.32	5	2.14	6	1.98	6	4.52	8	5.55	14	...	...
SEPTEMBER	6.35	17	2.63	12	4.54	9	2.71	11	4.75	12	2.45	9	7.39	14	3.00	6	3.92	9	3.02	10	2.90	7	11.32	21	...	...
OCTOBER	3.12	20	4.51	18	5.28	11	4.94	16	3.56	10	5.93	16	9.08	17	4.62	10	2.91	6	4.64	11	1.70	3	6.36	22	...	...
NOVEMBER	3.05	13	3.06	8	2.52	8	3.46	11	2.97	7	4.52	11	3.91	9	1.27	9	1.45	1	5.02	12	3.86	5	7.38	20	...	...
DECEMBER	2.94	14	1.53	7	1.23	2	2.71	11	1.32	1	2.50	10	4.65	12	2.03	12	Nil	...	1.96	5	0.60	2	5.43	15	...	...
TOTAL	45.39	130	33.85	113	45.47	101	42.96	113	38.84	108	43.89	118	53.19	135	33.61	99	25.82	57	37.19	95	28.88	58	58.31	168	2.49	7

Appendix 13—contd.

MONTH.	Namasagali.		Holma River Estate.		Nyondo.		Mutai.		Nsambya.		Bugondo.		Agu.		Lale.		Sisa.		Ndibulungi Estate.		Kabale.		Kizigo Estate.		Buye Estate.	
	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days	In.	No. of days
JANUARY	0.98	2	Nil	...	1.97	7	3.15	4	1.43	5	0.55	2	0.03	1	1.46	2	3.32	4	0.68	7	1.54	7	0.63	2	0.98	3
FEBRUARY	0.14	1	0.46	5	0.96	4	1.22	2	1.18	4	0.36	2	0.04	2	1.51	3	0.02	1	2.63	8	3.48	9	2.46	3	4.48	6
MARCH	3.74	7	1.72	10	2.33	6	1.71	5	1.32	7	0.10	1	0.03	1	0.07	3	2.00	4	2.91	10	5.40	11	4.51	6	2.13	4
APRIL	12.02	16	7.17	24	4.07	19	6.11	10	4.27	18	6.29	12	0.22	8	4.03	11	8.48	20	6.93	19	4.24	20	5.82	14	4.26	10
MAY	4.47	12	12.79	17	5.37	16	6.60	6	6.17	12	3.94	7	0.20	7	6.18	12	6.11	7	6.12	15	2.84	11	5.04	11	5.20	10
JUNE	1.74	10	3.35	18	3.64	16	3.07	4	3.61	7	2.38	10	0.21	6	1.93	9	4.33	8	3.07	6	1.12	5	2.74	6	1.71	5
JULY	2.30	7	0.74	9	1.98	13	3.35	9	0.86	3	2.19	8	0.17	6	2.71	7	1.65	3	0.81	3	0.05	1	0.81	3	0.13	1
AUGUST	8.83	13	8.83	15	3.41	19	4.67	9	2.77	11	2.05	9	0.21	6	2.91	12	2.78	4	4.21	10	0.77	4	4.65	7	2.44	4
SEPTEMBER	0.90	3	2.94	14	4.23	15	6.49	8	3.80	12	1.48	4	0.06	3	3.37	9	2.52	6	5.39	11	4.82	12	3.63	6	4.39	12
OCTOBER	2.70	5	6.00	22	2.55	7	3.42	6	1.87	13	2.16	7	0.08	3	3.43	9	1.79	5	2.68	11	3.81	15	3.06	6	2.43	7
NOVEMBER	1.01	8	4.36	15	1.97	9	1.80	4	1.78	10	1.65	11	1.89	6	4.91	7	2.91	7	1.29	8	3.70	13	5.61	10	3.73	7
DECEMBER	0.47	2	1.41	11	0.98	2	1.18	4	1.41	7	1.25	3	0.24	1	0.70	4	0.55	3	2.34	8	4.23	13	2.63	8	3.01	8
TOTAL	39.30	86	44.77	160	33.46	133	42.77	66	30.47	109	24.40	76	3.38	50	33.21	87	36.46	72	39.05	116	35.00	121	41.49	82	34.89	77